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## THE AGRICULTURE OF OHIO,

### AND THE PRESS AS CONNECTED WITH IT.—THE OHIO CULTIVATOR.

THE effect which may be produced by a single press, controlled by an active-minded, zealous man, and directed to the welfare of a particular branch of industry, has been clearly evinced by the results which have ensued the establishment of the "OHIO CULTIVATOR," by Mr. BATEMAN, at the Seat of Government of the "Buckeye" State.

A Board of Agriculture has been organized under legislative sanction; Societies have been formed all over the State; and by these has an impetus been given to the *mind* of cultivators of the soil in that powerful and flourishing Commonwealth, (an empire in herself,) which promises for her sons more true glory and more enviable distinction than are to be derived from the most fertile soil and the most abundant natural advantages. Sincerely do we wish her success in the career of intellectual investigation as connected with her greatest and most substantial industry. At what higher or nobler destiny can any people aim? What object, in comparison with it, is worthy to engage the attention of rulers or citizens?

With every disposition to befriend, and no motive to flatter the Editor of the Cultivator, we do not say that the forward movement in the line of agricultural improvement in Ohio is altogether the fruit of his zeal and ability. The materials were on the spot; the kindling may have been prepared, and even the sparks may have been scattered here and there; but it is obvious that since Mr. Bateman planted himself in their midst, and put his hands to the bellows, the blaze has been spreading far and wide, until the whole Commonwealth is getting illuminated. But all this could not have been accomplished without a cheerful spirit, and many willing hands on the spot to assist.

Older papers, too, such as the Albany Cultivator and the Genesee Farmer, of extensive and deserved influence, had doubtless opened the way, and so prepared the public mind that the *virus*, so skillfully applied by Doctor B., *took* at once. Would that all communities were equally liable to similar inoculation. But if a single press, in the midst of a great State, in the beginning like a still small voice in the wilderness, can accomplish so much, what might not be expected for the cause of *agricultural education* (which, after all, must underlie all great and general improvement), were it possible to enlist even the occasional aid of the general press of the country in behalf of that greatest of all national concerns?

The agricultural mind of the United States, if we may so express ourselves, is getting into a state of general agitation and anxiety on the subject of education, as connected more expressly with the tillage of the earth. In some of the States great progress has already been made in that direction, so that agricultural inquiry may be considered in a transition state, as it were, proceeding from the observation of certified results to the investigation of causes—from the collection of facts to the act of generalizing them—and thus, by establishing principles on the basis of practical observation, rendering more certain and infallible those results which have heretofore been the effect rather of chance than of science, thereby robbing the pursuit of the agriculturist of the only characteristic that can give dignity to success in any employment.

The next movement (and God grant it a speedy consummation !) will be a demand, on the part of the landed interest of the country, for the establishment of Normal Institutions at the public expense, adapted expressly to the preparation of teachers, who shall take charge of all our country schools, well qualified to give instruction in all the principles involved in practical Agriculture and in the literature that naturally belongs to, and that may serve to enliven and adorn the position and pursuits of the American farmer.

More than from ten thousand party effusions, was the gratification felt at finding the following passages in two leading Baltimore journals of recent date:

PROFITS OF FARMING.—At an agricultural meeting in Massachusetts recently, some remarks were made by Mr. CALHOUN, of Springfield, on the profits of farming as compared with other pursuits. The conclusion arrived at was that farmers, on the average, succeed better than merchants; that if, by way of experiment, one hundred men should go into a city and trade, and one hundred go to farming, at the end of twenty years the one hundred farmers would be worth the most money. Mr. Calhoun referred to some facts, statistical and other, to show the risks of mercantile business, and added, with regard to Agriculture:

"Here is a foundation that may be built on with more certainty than any other. Yet young men are rushing into cities to make their fortunes. It is all-important that the facts which have here been stated, now and at former meetings, should be deeply impressed on young minds. Mr. Brooks says 15 per cent. may be made on capital by any diligent and systematic farmer. Hon. John Lowell said 18 per cent.—All this may be done by farming intelligently. He had wondered that farmers generally could get along so well as they actually do in their careless mode of farming. For himself, he had regained his own health by farming. The fresh open air had restored him. He repeated his pleasure on hearing the numerous statements of the profits that may be made in this business. One more consideration should have much weight. It had been truly stated by his venerable friend from Framingham (Maj. Wheeler) that this business naturally leads the mind to contemplation, and to gratitude to the Ruler of the Universe, to whom farmers feel obliged to look for a blessing on their labors. No occupation so directly leads the mind to reflection on the works of creation. All that we eat, drink and wear, comes from the ground. In every view this occupation is important."

If the profits of farming in New-England can be made to rise to eighteen per cent., the advantages of our soil and climate ought to enable the farmers of Maryland to realize a still higher rate. *The importance of bringing Science to the aid of Agriculture is becoming more generally appreciated now than formerly, and we may hope that the results already realized may have the effect of perfecting an alliance so pregnant with beneficent consequences. It would be easy to make the elements of agricultural chemistry a part of the course of instruction in schools and academies—so far, at least, as to teach how to analyze soils and learn their different natures.* [Baltimore American.

To the above we add, with much pleasure, the following sound doctrine on the subject of *Teachers—their pay and qualifications.* By-the-by, what better test could one desire of the character of a nation, and of the progress it is making in useful knowledge and civilization, than the grade and qualification of the persons employed to *mould the mind and character of the rising generation?*—How infinitely more important for all truly glorious and Christian purposes, than are the qualifications of those whose sole business is that of being in the best possible manner prepared for shedding human blood! And, when comparatively as well skilled for teaching, how well entitled are they to at least equal pay and respect!

SALARIES OF TEACHERS.—We have received a pamphlet containing a discourse delivered before the Board of Public School Commissioners, by Rev. J. N. McJilton, against the reduction of the salaries of Teachers in the Public Schools. It is an admirable discourse. The point contended for is very clearly sustained. There can be no doubt that the teacher who devotes his time, talents and energies to the instruction of youth, should be liberally paid. None but those well qualified can discharge the highly important office of a teacher; and, to secure the services of such, an adequate compensation must be given. Teaching has heretofore been looked upon too much as a mere alternative or stepping-stone to something else, and hence many undertake it totally unqualified. It should be made one of the regular professions, and no one be allowed to teach without having pursued a regular course of study to that end. This would secure talent, education, and all other necessary qualifications. The profession of teaching would be looked to as permanent, and none but those who could command good salaries would be in requisition. Incompetent persons, who have been in the habit of teaching, would be under the necessity of seeking other pursuits more appropriate to their capacities. [Baltimore Patriot.

Oh! that Editors in other States, were it only occasionally, in their country papers, would exhort the farmers of the United States to reflect on the prodigious average elevation and improvement of their pursuit, in all respects, which could not fail to result from taking measures to have their sons *more expressly and thoroughly instructed in the art and principles of the great calling by which they are to live, and by which all classes are supported!* See the advantages enjoyed, as it respects the press and its all-powerful influence, by all other classes, in comparison with what it does for the defence and enlightenment of the landed interest! Look, in this particular, at the State of Ohio, for one, and, *ex uno disce omnes.* Contrast her agricultural population and productions with those of all other employments united, and then look at the number and cost of the mercantile and party political papers, as compared with those (might we not say, with *the one?*) whose province it is to watch over, to warn, to enlighten and advance the agricultural community! The force of the question we raise, and to which we invite the attention of the cultivators of the soil in Ohio, and in other States, to which it is equally applicable, may be better appreciated on a view of the facts which rise up before us as we proceed—as, for example: Look at the estimated value of the annual products of agricultural industry in Ohio eight years ago, as compared with that of other sources of her wealth and strength—assuming, as Prof. Tucker has done, one-fourth of their gross value as the annual value of the domestic animals (horses, mules, neat-cattle, sheep, hogs,) and the account stands thus:

| | | | | |
|---|---|---|---|---|
| Live-stock | | | | $8,447,526 |
| Wheat | bush. | 16,571,661 | $8,285,830 | |
| Oats | | 14,393,103 | 2,158,965 | |
| Maize | | 33,668,144 | 6,733,629 | |
| Other grain | | 1,659,884 | 669,179 | |
| Potatoes | | 5,805,021 | 870,753 | |
| | | | | 18,718,356 |
| Wool | lbs. | 3,685,315 | $921,329 | |
| Tobacco | | 5,942,275 | 297,113 | |
| Sugar | | 6,363,386 | 381,303 | |
| Products of dairy | | | 1,848,869 | |
| " orchards | | | 476,271 | |
| Hemp and flax | tons | 9,080¼ | 726,420 | |
| Hay | | 1,022,037 | 4,088,148 | |
| Other products | | | 1,896,666 | |
| | | | | 10,636,119 |
| Total annual value of the products of *agricultural industry* | | | | $37,802,001 |
| Of Manufactures | | | $14,588,091 | |
| Commerce | | | 8,050,316 | |
| Mines | | | 2,442,682 | |
| The Forest | | | 1,013,063 | |
| Fisheries | | | 10,525 | |
| | | | | 26,104,677 |

Thus it appears that the annual product of every source and of every class in the whole State united is less than that of the plow and the fields by $11,697,-324. Then, again, look at the distribution of the classes as employed in the various industrial occupations, as here represented according to the last census:

| | | |
|---|---|---|
| In *Agriculture* | 272,579 | |
| Mining | 704 | |
| Commerce | 9,201 | |
| Manufactures | 66,265 | |
| Navigating the ocean | 212 | |
| Internal navigation | 3,323 | |
| Learned professions | 5,663 | |
| | | 85,368 |
| Agriculture over all others | | 187,211 |

or more than three persons employed in cultivation to one *of all other classes combined.*

Now then look at the means at work for advancing the knowledge and the welfare of the manufacturer, the merchant, and the *political partisan*, a class of men who are ever riding but never willing to be ridden by the people. For the use of these artificial classes which grow out of and and derive their employment from the products of Agriculture, there are in the State of Ohio

| | | | |
|---|---|---|---|
| Daily papers | 16 | Semi-weekly | 1 |
| Weeklies | 81 | Monthlies | 2 |
| Tri-weeklies | 5 | Making | 105 |

papers collecting and diffusing such knowledge and such doctrines through all parts of the State as may be deemed most useful and acceptable, without any pretence of particular devotion to the cultivators of the soil. Besides these, if not against them, there is the OHIO CULTIVATOR, (a host, truly, in itself,) published at *one dollar a year*, standing, we believe, of its class, solitary and alone, and battling the watch single-handed for the whole agricultural community—while they, instead of making a point of duty and of honor, no less than of interest, to stand by it to a man, hesitate to contribute even one dollar a year to support that one journal exclusively dedicated to the very business of their lives, one which is to be the mindless drudgery, or, as it may be, the intellectual (and only as it is intellectual the worthy) occupation of their sons!

Is it possible to augur well of the destinies of a community, thus too mercenary to provide the suitable aliment for strengthening and expanding the minds of their children as relates to their profession, or too ignorant to perceive that in farming as in all else, light is knowledge, and knowledge is power? And yet we do augur most auspiciously for the coming community of Ohio farmers, because we see in the very Report before us of the "OHIO STATE BOARD OF AGRICULTURE," which we laid down to take our pen for the expression of the reflections to which a view of it gave rise—we see in this Report itself the most gratifying evidence of the existence and diffusion of that zeal and knowledge which promise not only to arrest the State in that downward progress to exhaustion which has marked the career of other and older States, but which will bear her upward and onward to a point of much higher productiveness than she has ever yet attained.

In fact, the able Introduction to this first ANNUAL REPORT OF THE OHIO STATE BOARD OF AGRICULTURE, by the distinguished President, ALLEN TRIMBLE, may itself be hailed as an evidence that Agriculture is in a fair way to take, in that State, the precedence to which it is everywhere entitled in the rank of industrial pursuits. It clearly indicates that the time is approaching when there will prevail throughout the State an abiding conviction that *their system of edu-*

*cation should be mainly, if not entirely, based on the great truth* that with the cultivation of the land must be connected the *cultivation of the mind.* Agriculture will reach and maintain its attainable excellence and its rightful supremacy only when the sentiment shall become general which was lately avowed with equal modesty and good sense at one of the meetings held in the Legislative Hall at Boston, where, according to that excellent paper, the MASSACHUSETTS PLOWBOY:

> Major WHEELER spoke at some length on the propriety of bringing up more young men to *learn the art of farming.* The rich would find their account in giving their sons a chance to acquire agricultural information. He repeated that he had long been engaged in other kinds of business; he had been in trade, and though he had never an opportunity of going to school much, he had not felt the want of education so sensibly *in any branch of business as in farming. Here he found he needed the aid of science.*

In the same commendable and auspicious spirit Mr. JENKS, of Boston, remarks:

> The importance of proper education cannot be too highly estimated. The difference between those mechanics who come here from Europe with a proper education and others is great. Those among them who are called *teachers* earn and receive forty per cent. more than other hands. Mr. Jenks thought the great improvement which has been made in plows was the result of scientific investigation. He had heard of a man who made a profit by farming with the aid of books alone, without any practical education. He was guided by science only.

We regret that we have not space at command to publish the whole of this introduction from Mr. TRIMBLE—but have we not occasion to experience that feeling every day, with so many very able addresses delivered to Agricultural Societies, which, could we follow our inclinations, would go far to fill every number of this Journal?

It appears by this Report that Societies had been formed, in the single year previous, in more than twenty counties. Of the nature and value of the information collected as respects the capability and products of the State, the reader may judge by supposing what replies would be elicited by the following "CIRCULAR." It is only, as every one knows, the disinterested and public-spirited who will take the trouble to answer such Circulars; therefore the information they impart is generally the most reliable to be had. The most wealthy are frequently content to guard their money-bags, and while they avail themselves of other people's communications, are either too lazy or too selfish to impart any. We the more incline to make room for the Circular, as we hope it will be adopted, with modifications to suit circumstances, and be addressed by other Societies to prominent men in all parts of the country:

> CIRCULAR OF THE BOARD.—The following interrogatories will show particularly what information is desired by the Board:
>
> 1. What is the prevailing character of the soil of the country—is it mostly rolling, or level—sandy, or clayey—and what kinds of timber predominate in the forests?
>
> 2. What are the principal kinds of farm crops or agricultural productions?
>
> 3. What was the character of these crops the past season as to yield and quality, and what is supposed to have been the yield of each, per acre, with ordinary cultivation?
>
> 4. Have you any reliable information or statistics of the aggregate amount of any staple products sold or produced in the county? if so, give the same, and the name of the source whence obtained.
>
> 5. In what towns or cities are the surplus productions of the county mostly marketed, and what have been the prevailing prices paid to farmers for the same the present season?
>
> 6. Have any considerable improvements, within your knowledge, been introduced in your county during the past two or three years, in the modes of farming or the kinds of farm crops, implements or stock?
>
> 7. Is there any Agricultural Society, or Farmers' Club, at present organized in the county? if so, give the names and Post-Office address of the principal officers, and add any other particulars respecting its history or transactions that may be deemed interesting. (Such Societies as have drawn money from the County Treasuries, in accordance with the law passed last winter, are required to make a report in accordance with the instructions of the Board, published in the Ohio Cultivator of April 1, 1846.)
>
> ☞ It will be proper for you to add any other facts or suggestions relating to the Agriculture of the country, or the means of its advancement, that may occur to your mind. It is desirable,

however, that these reports from the different counties should be as brief as perspicuity will allow. The Board are already in possession of statistics showing the number and average value of the different kinds of farm-stock in the several counties—the value of the lands, &c., as given in the returns of the Auditors.

After all, the average product of this comparatively new and fertile region will be found to fall below that of England, where science in the knowledge and use of manures particularly, and in the principles of rotation and tillage, have brought up the average product from 17 bushels, in 1821, to 26 bushels to the acre. But what may not be expected of the improved Agriculture of a country where a close observer tells us that on stepping unexpectedly into a country school on the road-side in Scotland, he caught "a class of poor barefooted boys going honorably through a close examination in Agricultural Chemistry."

Who can conceive what would be the blessings for Ohio, and for other States, if now she would only take enough of the public money levied on the farmers, directly or indirectly, and establish at Columbus or elsewhere an institution, with a few *able* Professors, exclusively for the instruction of *teachers* (for that is what we want,) who would ultimately take the place of incompetent instructors, and educate all the boys of the State as thoroughly in the science and practice of Agriculture as the Cadets at West Point are now educated in the science and practice of gunnery?

It was with a view to address queries similar to these (with others that we will hereafter suggest) that we made the request some time since, that some officer in every Agricultural Society in the country would only have the goodness to take five minutes' time and the smallest modicum of trouble to give *the name and locality of his Association;* but not more than half a dozen answered the call. Had a like call been made on the heads of manufacturing establishments, or Chambers of Commerce, or any other associated interests, they would have come together like gallant soldiers at the sound of the bugle. Not one in one hundred would have failed to respond. Such is the difference in sensitiveness to all that particularly concerns them between the artificial classes and the great substantial body of the people—the farmers—on and by whom every other class lives.

To the question in the Circular as to the introduction and use of improved implements in the several counties, we observe that Mr. Keene, of Champaign county, says as to reaping and threshing and drill machines:

6. *Hussey's* reaping-machine, worked by horse-power, was introduced in this county during the past harvest, and some two or three hundred acres of wheat cut with it. It cuts the grain without waste, and leaves a short, even stubble. It employs nine men and four horses to work it, and cuts, upon an average, 12 to 15 acres per day. The man who sits on the machine, to pass the grain off the platform, works very hard and to great disadvantage, from the position in which he is obliged to sit. Machines are now being made in Urbana, our county town, to order, by a machinist who promises to make them so that they will pass off the grain to the binders for any sized sheaf that may be desired, thus superseding the necessity of a man on the machine for that purpose. Improved threshing-machines, whereby the grain is threshed and cleaned by one operation, at the same cost per bushel as was formerly paid for threshing alone—are now in pretty general use in this county. The wheat-drill was used by several of our farmers last fall, for the first time. The great advantage of this mode of seeding is said to be in the yield, of which I cannot speak. We have no Agricultural Society in operation in our county, nor any regular Farmers' Clubs.

For ourselves, we know of no one who has taken more interest in improved machinery, for these purposes, or who is better prepared to illustrate their advantages, than JOHN JONES, Esq., of *Wheatland*, Delaware. There only have we

seen even the stubble of a crop of drilled wheat. The following serves to exhibit the results of the queries as to the average product of some of the chief staples of Ohio; it may gratify and in some respects surprise the reader, we don't say in what way—that will depend on his own whereabouts and his previous impressions as to the agricultural capacity of this young giantess among the sisterhood of American Republics. It would be easy, we should think, to add various queries to such Circulars that would elicit highly interesting information —as, for instance, the ordinary price of land; the price and the hours of labor; and then as to orchards, dairies, the kind of animal power, &c.

| Counties. | AVERAGE PER ACRE. | | | Counties. | AVERAGE PER ACRE. | | |
|---|---|---|---|---|---|---|---|
| | Wheat. | Oats. | Corn. | | Wheat. | Oats. | Corn. |
| | *Bushels.* | *Bushels.* | *Bushels.* | | *Bushels.* | *Bushels.* | *Bushels.* |
| Adams | 10 to 20 | 20 to 30 | 20 to 50 | Knox | 25 | 40 to 45 | 35 to 40 |
| Allen | 15 | 50 | 50 | Lake | 12 to 14 | 35 to 40 | 30 |
| Ashland | 20 | | 40 | Lawrence | 10 | 25 | 30 |
| Ashtabula | | | | Licking | 20 | | |
| Belmont | 15 to 25 | 30 to 40 | 40 to 60 | Logan | 15 | | |
| Champaign | 15 | 20 to 25 | 45 | Lorain | 15 | 40 | 40 |
| Clark | 18 | 35 | 40 | Madison | | 25 | 30 |
| Clermont* | 10 to 25 | 25 to 40 | 35 to 70 | Marion | 16 to 20 | | 35 to 40 |
| Columbia | 20 | 45 | 40 | Medina | 20 | | |
| Coshocton† | 17 | | 35 | Meigs | 12 | 30 | 35 |
| Crawford | 20 | 40 | 40 | Morgan | 15 | | 40 |
| Cuyahoga | 20 to 40 | | | Montgomery | 18 | 30 | 50 |
| Delaware | 20 | | 45 | Miami‖ | 17 | 30 | 40 |
| Fairfield | 15 to 30 | 20 to 40 | 36 to 50 | Muskingum | 8 | 30 | 40 |
| Fayette | 12 | | 40 to 45 | Perry | 20 | | |
| Franklin | 12 | | 40 | Portage | 20 | | |
| Gallia | 13 | 25 | 25 to 30 | Pickaway | 14 | | 50 |
| Geauga | 20 | | 40 | Richland ....total | 1,200,000 | 600,000 | 300,000 |
| Greene | 15 | 30 to 35 | 35 to 40 | Ross | 10 | 23½ | 48½ |
| Hamilton | 16 | | 50 | Stark | 20 | 40 to 50 | 30 to 35 |
| Hardin | 20 | | 35 | Summit | 20 | 45 | 35 |
| Harrison | 20 | 30 | 40 | Washington | 15 | 33 | 45 |
| Highland‡ | | | | Wayne | 20 | 40 | 40 |
| Huron | 20 | | | Wood | 20 to 25 | | 40 to 50 |

*4. I have no information derived from reliable sources. In the corn trade, we have seven distilleries (!!!) in this age of temperance—making daily, in the aggregate, 150 to 175 barrels, of 40 gallons each, of whisky. Two distilleries in my vicinity have taken in about 100,000—and "*still* they come." From this data I compute that this year's crop will furnish distillers alone 400,000 bushels of corn.

As a set-off to the above, we must give the following from the same respectable reporter, Mr. James Ferguson:

There is a gradual progression in the upward tendency of Agriculture in the county; better hogs, sheep and cattle are being introduced—(horses neglected)—better varieties of wheat and corn are being sought for. Most of our farmers are nearly up with the times in agricultural implements; I know of nothing, however, that calls for *special notice*; yet all are *far*, VERY FAR, short of what the soil, situation, the times, the calling, and the age require.

The only association of agriculturists in the county is known as the "Franklin Agricultural and Horticultural Society. We have been organized one year—number but 56 members—levy no tax, draw no money from the treasury—pay no premiums in money—make our certificates of merit suffice—have had one Fair—the exhibition respectable, exciting no little interest, while every one remarks that "the next will doubtless be a splendid affair." *We have a fair prospect for a respectable farmers' library. Agricultural Chemistry is being studied by a few already, as well as Geology and Mineralogy*, while few could tell you the *name* of the "latest novel"—so far good: still we are most of us on that old "*tread-wheel*"—that interminable circle which our ancestors have trod for the last thousand years—and too many planting and sowing by "the signs," and "*right time in the moon.*" Farmers are getting rich here from Nature's bounties. We have the *same geological formation*, and nearly as good a climate as the famed PALESTINE of the Old World. Shall ignorance, bad tillage, and bad government of a first luxurious, then vicious, ignorant and degenerate race make this, as that, a desert waste!

Now is the time for the philanthropist and statesman to fix the standard of worth high in the intellectual and moral temple of fame; to fix the taste and elevate this first, greatest, and noblest of all pursuits, and he has the proud satisfaction of starting his race onward and upward to that high destiny in reservation for yet purer and nobler intelligences. How shall ignorance be driven out, superstition dethroned, listlessness aroused, lethargy thrown off, and the *man* be aroused to what he is, *a thinking, active, superior intelligence*, rather than a plodding drone.

† 6. No important improvements have, within my knowledge, been introduced in this country. Allow me, in addition, to suggest that one of the most desirable and important improvements

These reports are evidently based, in a great measure, on conjectural estimates, but are doubtless made with a wish to arrive at and present the truth. If, then, where the estimate is, for example, from 10 to 20, and so in other cases, we take the medium as the average, it will be found that if we take these counties as the average of the State, the average product is in wheat about 17 bushels; in corn 40; and in oats 33. Can any one inform us, or give a guess, what was the average in Jersey, Delaware, Maryland and Virginia when they had been *opened* not longer than Ohio? Two friends of ours, one in Talbot county and one in Dorset, made last year, the first, more than 70 bushels of corn on upward of 40 acres, and the last more than 50 on 200 acres. They are, "av coorse," as the Irishman says, both subscribers to THE FARMERS' LIBRARY AND MONTHLY

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would be the erection of manufactories, especially of wool and cotton, on the immense water-powers of our streams and canals. It is doubted if any section of the Union offers equal facilities for such establishments, in cheap and durable water-power, and in the abundance and low price of timber, stone, and all the materials for building, including the very small cost of lots and lands; and in all these respects no part of the State is more inviting to the manufacturing capitalist than the valley of Muskingum. To name only a single point: at Roscoe the canals bring together the whole water-power of the Tuscarawas and Walhonding, the latter standing in the canal at this place 40 feet above the level of the Muskingum, and, the canal being comparatively little used, the whole power of the stream, capable of performing almost anything desired, could be used for manufacturing purposes; and sites for a whole manufacturing village could be purchased comparatively for a trifle. What I have said of Roscoe is a feeble portrait of the advantages for manufacturing purposes of hundreds of places in our State—to say nothing of the coal district on our north-eastern border.

Your honorable Board cannot do a better service to the agricultural and other interests of the State than by calling the attention of manufacturing capitalists to this subject. By establishing manufactories in the West, they would avail themselves of the certain and unfluctuating *tariff of distance*; saving the carriage of goods from the East to the West, and the carriage of the raw materials, wool and cotton, and provisions from the West to the East; and these advantages, together with the cheapness of water-power, lands and building materials, would be unchanged by political ups or downs, ins or outs. Will you not present this matter in a strong and clear light to the great manufacturing capitalists of the Union?—urge them to come and see the immense capabilities and facilities with which we can present them.

*Live-Stock.*—Horses 6,690; cattle 12,503; sheep 47,009; hogs 17,728.

‡ There is no report of average crops for this county, but in lieu of that we have something better—the following reflections by ISAAC SIMMS, President of the Agricultural Society of the county, which shows that one man, at least, is alive to the disgrace that attaches to all communities that betray indifference to the education of their children. He not only knows the seat and nature of the disease, but, like a skillful physician, he prescribes the appropriate remedy:

"In vain shall you address the man of gray hairs, who, having always plowed *so*, has yet harvested wheat, and who, having never manured, has yet gathered corn. But place his son and daughter in the district school, under a teacher of ordinary intelligence, who, having studied, shall teach, among other things, *a suitable course of rural economy and agricultural science*—to them, thus trained, rational experiment and accumulations of knowledge in Agriculture will become a necessity, and intercommunication of results and opinions a delight. *To the popular education, then, let the energies of good men be directed.* The district school system of Ohio is perishing by the most cruel neglect. It were capable of all that is elevating and excellent, were it made to improve with the growth of the people in numbers and wealth. *But it stands, while all else advances; and the youth crying for bread, receive a stone! Vast and illimitable are the sources of national greatness lying ready to be evolved in the untried depths of the juvenile mind. To this level must Statesmen sink their shafts, before the clear waters of general intelligence will gush abundantly.*

‖ One of the most gratifying things in all these Reports, in our view, is the following—by whom it does not appear—from Miami county:

The number of members at present is seventy-five, with a reasonable prospect of a large accession before the commencement of the ensuing season. The Society having been organized at so late a period, it was deemed inexpedient to have an exhibition for awarding premiums the present year. This resolution was made in view of the chief benefits sought to be attained by the organization of Agricultural Societies. These advantages are to be found, not so much in the production of extraordinary results as in the establishment or discovery of means and processes by which a given result may be attained with the least amount of expenditure, whether it be of labor or of capital. SKILL and INTELLIGENCE are to be encouraged, rather than a blind reliance upon chance and the operations of Nature, without those aids which she requires at the hands of man, if he would enjoy those bounties which she is capable of bestowing. In short, we believe that the premium should be awarded to the MAN, rather than to the bullock or the porker brought for exhibition. The Society have appropriated the *sum of one hundred dollars for the purchase of* BOOKS *to form the commencement of an Agricultural Society.*

JOURNAL OF AGRICULTURE—not by any means because they are our friends—for we trust we have many who are not subscribers *yet*—but, we infer, because they make heavy crops!! But, all jesting apart, we should be glad to have the statements of the average of staple crops in other States, on the most reliable data, together with the general price of land and labor. We confess we are persuaded that most of those who think of moving from the old States had better let very well alone, and turn to improving their own land—planting orchards, improving their stock, repairing their buildings, retrenching expenses, and especially to the establishment of better systems of education; and let them mind first to elect *thinking, capable men* for their Legislatures, and then take care who are put on the Committees on *Education and Agriculture!*

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## GUANO.

### HOW, AND FOR WHAT, AND IN WHAT MANNER TO BE USED.

WE are not advised of the general results of the use of this substance in the United States during the last year. The truth is that our country is deficient in the means of making general reports, such as are more easily prepared and published with much usefulness to the public in other countries. In the first place, our *dominion* is too extensive, and then we are deficient in the organized institutions for the benefit of Agriculture that exist and faithfully sympathize and coöperate with each other for common welfare in other countries.

The first difficulty is likely to be increased; for we are expanding, *ad infinitum*. Otherwise, and even as it is, there are reasons to hope that the last-named obstacle is being diminished, and that the cultivators of the soil are gradually coming to a better understanding with each other in all that relates to their character and concerns, political and practical. But all depends on a reform, gradual though it be, in our systems of education, *adapting them expressly to the agriculturist's own pursuits.*

We believe—(and, on this subject at least, we may be allowed, without being considered an intruder, to entertain an opinion)—we believe that failures in the use of guano have proceeded, in our country, principally from two causes:

1. Sufficient care has not been taken to prevent all actual contact between it and the seed of the crop to which it has been applied.

2. It has not had the benefit of a certain degree of moisture, which seems to be indispensable to the development of its fertilizing powers—and this has resulted from the natural dryness of our climate compared with that of England, where it continues to give satisfaction, aggravated by exposing the guano too near the surface, which is fatal to its operation unless it be a wet season.

Mr. McHenry, an enterprising (in a word, a *thinking*) farmer of Maryland, as has been already stated, is a decided advocate of the use of guano, after many trials, and he spreads and plows it in for corn; and we see it stated in the proceedings of that old, persevering, zealous and efficient Farmers' Club of Newcastle county, Del., that Mr. Jones, of Wheatland, intends to follow that practice; and it may be added that *his* purchase of eighteen tons for use this year, is a fact of no little significance in its favor.

It is scarcely necessary to repeat that, besides that it combines in a very pe-

culiar manner many of the most essential fertilizing properties and constituents of the various crops, the value which it derives from its *portability* almost defies calculation! For in no country in the world does a labor-saving property of itself confer so much value on anything as in this. While labor is everywhere dear, food and everything else, and especially land, is everywhere metaphorically and literally "*as cheap as dirt.*"

Let us stop here again to say that Farmers' Clubs should be formed in every election district in the Union, and that, through their instrumentality information might and ought to be collected on all such subjects as this. Why, for example, through a Farmers' Club at Upper Marlborough, or at Leonardtown, or at Easton, or at Cambridge in Maryland, might not every reading farmer in the county be made perfectly familiar, through the papers at those places, with all that has been done and experienced with guano or lime throughout these counties respectively up to this date? But we must come back to our purpose, which was merely to submit the following instructions for the use of guano on turnips by a Scotch farmer of great experience.

If we are met with the standing interrogatories—Don't you know the turnip culture is not the branch of husbandry in this country that it is in England? we answer Yes; and what fool does not? But the observant reader will see that there is still ample room and verge enough to turn all such communications of experience to useful account. If we may not apply guano to turnips on a large, we may on a small scale; and besides, the directions given may be useful in the application of guano to any other drilled crop, and corn is getting to be one of them.

From 'The (London) Plough.'

## METHOD OF APPLYING GUANO FOR TURNIPS.

*Sir:* I am desirous, through the medium of your journal, to call the attention of agriculturists to the proper mode of employing this valuable manure. I have every reason to believe that want of success, or disappointment, from the use of this article, in so many instances, in England, has arisen altogether from inattention to the proper way of applying it; and I have no doubt that, were a fair trial in every instance made, according to the method adopted in my own practice, and so generally alowed here, guano would soon be in as universal repute in England as it is now throughout Scotland. I feel the more called on and encouraged to communicate my farther experience, and to make the present recommendation to my brethren in the South, as I believe I was among the first to point the attention of agriculturists, generally, to the practical value of this first of manures in the growth of turnips, and have since very successfully, and without one instance of failure, extended its application to this crop, to the extent of considerably upward of 100 acres, in each of the two seasons. My method, then, is simply this: After reducing the guano, by means of bruising and sifting, to an equal and uniform consistency, to apply it in the drill, by the hand, without any admixture of other substance. The drills being formed in the usual way, as in Scotland generally, for the reception of other manures, in preparation for turnips not quite so deep, perhaps, as for farm-yard dung, the guano is applied from the hand, in the center of the original rib, or drill, which being reformed by being split, the manure is effectually covered, so as to prevent injury to the seed by contact, which, it is presumed has been the entire cause of failure when a different method has been pursued. The seed is then sown, by the ordinary drill-machine, on the top of the drill so made up. In no case ought it to be attempted to put in the guano along with the seed, or by means of any implement where a full covering of earth does not intervene between the manure and the seed; and, indeed, from the nature and consistency of the material, it is very doubtful if it is at all possible, by any machine, to distribute it in that equal manner necersary for the growth of a uniform crop. I may farther mention that the guano is here applied by women or boys, who, upon the land being stepped off, are supplied from a car at either end of the drills, with no more than is sufficient for each; and in this way, after a few turns, they obtain an exactitude in the operation, which is abundantly evidenced from the precise equality of the crop, and which may be said to be characteristically indicative of turnips manured with guano. The usual quantity I have employed per acre is 3 cwts.; and, though it does seem of small bulk to distribute so far, and, indeed, when

scattered along the drill, to appearance almost invisible, still there will be found no practical difficulty in the operation, and, I have no doubt, perfect satisfaction in the result. The quantity required for any ordinary length of drill is thus easily carried in an apron, and is much more manageable than if any admixture had taken place. Thus, upon a length of 200 yards, the drills being 27 inches apart, not more than 11 lbs. will be necessary, at the above rate, so that one woman can easily accomplish 3 acres a day. The expense of the operation is thus almost nothing, while it affords great facility to increased expedition, at so important and precarious a season, seeing the success of the turnip crop requires the operation of sowing to be limited to a very short period of time. It will be noticed that guano, to be properly adapted for being used in the manner above recommended, must be of a consistency fitted for equal distribution; and, in all cases, farmers should particularly observe, besides, that the analysis is favorable, that the material is free from moisture, and so composed, if containing lumps, that these may be capable of easy reduction by pressure, or with the hammer. When guano is so moist as to resist being again reduced to powder, after having been compressed, or the lumps already existing refuse to yield to trituration, it is quite unfitted for efficient distribution, with a view to the growth of turnips in the manner I have proposed; and by no process of admixture with other bodies can it be rendered so suitable, but could only be applied, with any advantage, as a top-dressing to green or other growing crops.

In reference to the price, which, when practicable, should help to illustrate all such discussions, the last "American Farmer" says of guano:

We regret to learn that the dealers in this article have considerably increased the price recently. Peruvian had been selling at $41 50 per ton, but is now $50. The cause may have been produced by the rise in the price in England. From the Sheffield and Rotherham Independent, of Feb. 27, received by the *Hibernia*, we make the following extract:

"*Corn Exchanges.*—A good stroke of business has been done in the guano trade since our last, and the stock of the country having been considerably reduced, prices, as foretold a fortnight ago, have advanced. All qualities have risen from 20 to 30 shillings per ton, excepting Saldanha Bay, which is quoted only 10 shillings per ton higher."

By-the-by, we may notice that Mr. Naill, of the Senate of Maryland, vigilant for the interests of his class, got a law passed at the last session for the inspection of guano. In England the farmer, in most cases, we believe, requires to be furnished with a sample and a well-assured analysis from the merchant, and comes down on him for damages if the mass is not found to correspond. We have some doubts whether in all such things, even in the inspection of tobacco, it would not be better for the producer if the article were left free to be regulated by the conflicting interests of the two parties, untrammeled by legal fetters.

While on this subject, truth and propriety suggest a remark on the powerful agency sometimes exercised by public-spirited individuals in matters of public concern, where they have no private ends to be answered. In regard to this second attempt to introduce a knowledge of the wonderful properties of this substance to the notice of American agriculturists, if it had not been for the untiring perseverance of Mr. GEORGE LAW, of Baltimore, in this matter as in whatever else he undertakes, availing himself of a correspondence as extensive as it is valued by those who enjoy it, the use of guano would have made its way but slowly, in all probability—if, in fact, it had not failed again now as it did when the substance was exhibited and its virtues proclaimed so many years ago in Maryland.

Without any of the mere mercenary promptings of the monopolist or the speculator, Mr. Law scattered much of it, far and wide, gratuitously, and instigated most of the experiments that were made demonstrative of its qualities as a manure at once the most condensed and, if not the most enduring, the quickest and the most convenient of application.

We mention it on the principle that justice is due even in fuller measure, to those who seek no recompense for useful actions but the gratification of their own kind nature in the performance of them. Why is it that by the Press,

whose office it should be to inculcate the performance of actions the most *useful* to society, it is denounced as abject flattery to praise the most benevolent and beneficent deeds in *peaceful life*, yet quite legitimate to extol to the seventh heaven the deeds of living actors in scenes of "blood and carnage?" All this may be right and proper; but be it our humble duty to honor, in our way, and to hold up to emulation the example of those who best teach us to fructify the earth.

Since penning the above, we find the following in an array of striking "*facts*" illustrative of the effect of guano, in that staunch old agricultural periodical, the AMERICAN FARMER, fed editorially, as it would appear, with that *elixir vitæ* which with age imparts strength. This fact is so extraordinary that it were almost to be wished the *name* of the farmer, his locality and soil, had been given, although, for ourselves, the confidence of the Editor of that paper in the accuracy of the statement makes "assurance doubly sure." And, after all, it does not excel the influence of plaster of Paris (gypsum) as shown in the case of the late Governor BOWIE, who gave $1,400 for 200 acres of land, and on turning in the first crop of clover that followed the application of the gypsum, made 100 hogsheads of tobacco on 100 acres of it. The tobacco was sold for $10 a hundred, or $10,000 for the crop. Governor B. was "every inch a man" on whose word one might safely stake his life.

An acquaintance of our informant bought, in his neighborhood, a farm consisting of upward of 200 acres, for $1,200. This farm had been worked without manuring until everything partaking of the character of fertility had been extracted from it, as may well be imagined from the price we have mentioned above. In the opinion of the owner of the farm in question, without manure, it would not have yielded 6 bushels of wheat per acre; and this opinion was corroborated by that of our informant. In the fall of 1845, the present proprietor came into possession of his farm, and having faith in the virtues of guano, purchased a sufficient quantity to enable him to spread on each of 100 acres thereof, 350 lbs. of that manure, which he caused to be *plowed in*, and then sowing his wheat, harrowed the latter in. The product was 25 bushels of good wheat per acre, from the sale of which he was not only enabled to pay the whole of the purchase money for the entire farm, and the cost of the guano, but to have a surplus left.

## CONSUMPTION OF GRAIN IN GREAT BRITAIN.

SIR: Messrs. Sturge's Circular for this month has to-day been received here, and it will doubtless find a place in your columns, as being at all times a valuable and important document, and never more so than at the present moment. The bearing of the writer's views is evidently of a pacifying nature, but on studying its contents I cannot do otherwise than form quite an opposite opinion. Admitting a *doubtful point*, that the last year's crop of wheat was an average one, how can that and the stocks as there stated—equal to 6,000,000 qrs.—suffice for twelve months' consumption, barley, oats and potatoes being deficient, and seeing that the annual importation of all descriptions of grain for years past averages nearly 6.000,000 of quarters, which quantity is only adequate to supply the loss of the potato crop, and thus requiring the whole quantity of wheat *supposed* to be on hand at the time of harvest?

| | | |
|---|---|---|
| Taking the average import of grain (including Ireland) into Great Britain, upon 7 years | qrs. | 6,000,000 |
| The loss of the potato crop | " | 6,000,000 |
| The deficiency of the oat and bean crops (1-5th) | " | 4,000,000 |
| Ditto barley crop (1-4th) | " | 1.500,000 |
| Total | " | 17,500,000 |
| Less supposed quantity on hand | " | 6,000,000 |
| Shall we not require of foreign grain | " | 11,500,000 |

For at the time of harvest the stocks of oats, barley and beans, of home growth, were nearly exhausted; and this quantity, about double of our late large annual imports, would require an amount of shipping of about 1,725,000 tons.

Should the next harvest be a late one, it must be borne in mind that our monthly consumption is 1½ millions of wheat. For barley, &c., we might wait; but of oats we should require a considerable quantity, not less than one-third of the quantity of wheat named.

I respectfully beg the attention of Messrs. Sturge & Co. to the foregoing, and should feel obliged if they can point out any inaccuracy in the statements given, my object not being controversy, but, as far as it can be ascertained, to give a correct statement of the real position of the country on the momentous question of a supply of food. I am, sir, your ob't serv't. A SUBSCRIBER.

*Hull*, Feb. 5. [London Mark Lane Express.

# CAPITAL AND ENTERPRISE.

## THE INFLUENCES BY WHICH THEY ARE TRANSFERRED FROM PLACE TO PLACE.

In a late number, reflecting on the tendency of enterprise and capital to flee from the country to cities, and thence inferring that facilities exist in the towns in the way of capital and encouragement in various ways, not to be enjoyed in the country, we invoked light on the subject, and took the liberty of referring to particular gentlemen, publicists and authors, whose minds had been led, by their studies and professions, to such subjects.

From one of them we received the following, in a very few days after that number was published, but yet not in time for the April issue.

We shall give, as soon as possible, the form of the general laws under which associations of capitalists are so easily formed, believing, with our correspondent, that the use of money should be left as free as possible, and that wherever the trade in it shall be least hampered by legislative restrictions, there will it most abound, and there will it attract and reward labor and enterprise of every sort. We have not room for these laws in this number. In fact, there will be in it too little variety, perhaps, "any way we can fix it;" but we rely on the solid value and wholesomeness to make up for the want of variety in our bill of fare for this month. The Letters on Sheep Husbandry necessarily exclude lighter articles, but have they not their intrinsic and amply remunerating value for all who have, or are likely ever to have, any concern in that very important branch of husbandry?

We shall look. too, into the subject of Inspection Laws, about which our Maryland friends are moving, as we apprehend, with not the longest-sighted views of the subject; but we don't yet exactly see our own way clear. In fact, we want time for investigation. Here, too, we hope for the aid of a gentleman who has the elegant leisure and the benevolent disposition to give us the assistance of his powerful pen, which illustrates whatever it touches.

*Dear Sir:* You appear to be at a loss to understand the causes of the apparent deterioration of houses and farms in Western New-York; of the transfer of capital from the country to the cities; and of the absence of value in the lands of Virginia and South Carolina: and somewhat disposed to think that all are connected with the state of the laws regulating the rate of interest.

All the facts are, as I think, easily explained by aid of a very simple law, that is universally true, as all laws must be, and which, nevertheless, is opposed to the very prevalent doctrines of Ricardo and Malthus. Being so, I shall not now insist upon it as regards Europe, but you can readily satisfy yourself by a comparison of Massachusetts, New-York, Pennsylvania, Ohio and Indiana, on one hand, with Delaware, Maryland, Virginia and South Carolina on the other, that it is universally true in these United States. It will be found equally true in comparing one part of the same State with another part—as, for instance, Lowell and its vicinity with the neighborhood of Cape Cod; Schuylkill county, Pa., with Bucks, or Delaware, or Adams, whose progress is comparatively slow; or Hamilton county, Ohio, with some of those not yet possessed of the facilities afforded by railroads or canals; and equally so in comparing the several parts of New-York, Philadelphia or Baltimore with each other. It is as follows:

Wherever population tends to increase, there exists a tendency to a still more rapid increase of wealth, which manifests itself in an increased demand for labor, increased wages, increased tendency to the division of land into smaller farms and into building lots, increase in the number of houses, and improvement in their character and appearance, as well as in those of the people by whom they are occupied. Whenever, on the contrary, in any country or place, population becomes stationary, or tends to decrease, there arises a tendency to a diminution of wealth more rapid than that of population, accompanied by a state of things directly the reverse of that above described. Such is the law, and I will now

proceed to show that the facts to which you refer as existing in Western New-York, are in direct accordance with it.

By reference to the Merchants' Magazine for the present month (March), you will see, at page 295, a comparison between eight of the principal counties of the Genesee Country with a similar number of counties in Michigan, showing that while the population of the former diminished, between 1840 and 1845, from 321,538 to 317,613, the latter grew from 109,183 to 141,247; and that while the product of wheat in the former remained almost stationary, its advance in the latter was enormously great. From these facts, it is obvious that the emigration from Western New-York exceeds the immigration, and that there must be more sellers of land than purchasers—a state of things that will account for the deterioration of appearance to which you refer, always a certain sign of diminished population and wealth.

Why do people leave New-York for Michigan? To answer this question requires local knowledge that I do not possess, and you must seek the information elsewhere. When you can obtain that, you will understand the cause of the state of things you have noticed.

Your friend attributes the state of things which you describe to the high legal rate of interest, by means of which capital is attracted from the country to the city; but the rate is the same in both, and, if the existence of such a law tends to produce that effect, why do not both country and city equally attract it from other quarters where the legal rate is lower—as, for instance, Massachusetts, Connecticut and New-Jersey, where it is only six per cent.? Why is it that those States retain their capital, applying it to the fertilization of their soil, the extension of their manufactures, and the improvement of their communications, under a six per cent. law, while Genesee is unable to retain hers under one that allows the owner to demand seven per cent.? Could this happen unless there were local causes tending to produce it? I think not. The question now arises, Does any large amount of capital from Western New-York seek permanent investment in the city? It appears to me much more probable that the tendency is toward Michigan, where capital is *less* abundant than in Genesee, rather than toward New-York, where it is *more* abundant, and where it must always come into competition with that of the adjoining States, in which six per cent. is the usual rate. Population and wealth are, I think, both traveling from Western New-York to a region farther west, in which labor and capital can be made more productive. Such being the case, a reduction of the rate of interest would only accelerate the progress of expulsion, and increase the downward tendency of which you speak.

Every increase in the freedom with which capital may be applied tends to cause it to flow inward, and to produce equality in the supply and steadiness in the price. Every restriction tends to force it out, and to produce inequality and unsteadiness. In New-York, contracts are legal up to seven per cent., and there is, consequently, more freedom for the exercise of individual will, as regards its application, than there is in New-Jersey, where six per cent. is the limit. There is, therefore, a tendency to the transfer of capital to New-York from the latter State; but, if the rate be reduced to the same standard, every Jerseyman will prefer investments at home to those abroad, and the power of employing labor in the first will be diminished, while it will be increased in the last. In Missouri, freedom of action in regard to the rate of interest has existed, up to the point of ten per cent.; and that State has, in consequence, attracted large amounts of capital from the East. It is now, however, about to reduce the rate, the effect of which will be to cause the holders of mortgages to convert them into money to be drawn home, and thus the State will suffer from diminution of the right of individuals to judge for themselves of the terms upon which they will trade with each other. Every step in that direction is wrong, and tends to the expulsion of labor and capital; and every step in the opposite one—whether by removal of restrictions on the rate of interest, or on the right of individuals to associate together for banking or other purposes, and to determine for themselves the terms upon which they will trade with the public, whether of limited or unlimited liability—tends to promote the influx of wealth, the increase of population, the rise of the value of labor, and the advance of improvement—physical, moral, intellectual and political. There is more freedom of association in Rhode

Island and Massachusetts than in any other part of the Union, and therefore more steadiness in the rate of interest and in the value of property, with less necessity for usury laws, and consequently a more rapid advance in prosperity. Those who would desire to be as prosperous should commence by a determination to be as free, and not seek to obtain the same object by means diametrically the reverse of those which are there employed, as is done in Pennsylvania, where freedom of trade is held by those who call themselves Free-Traders, to consist in *not* permitting men to determine for themselves the terms upon which they will associate with each other, for the purpose of trading with the public, even where that public is left entirely at liberty to judge for itself of the terms, and to determine whether it will trade with them or not.

A comparison of the systems of those two States with that of Pennsylvania will serve to exhibit the process by which capital is driven from the country to the cities, even where its owners would prefer to retain it at home under their own management, if permitted by legislators to determine for themselves the mode in which it should be employed.

In no part of the world is the doctrine of equal rights so well understood as in New-England, and in no part of New-England better than in Rhode Island and Massachusetts. What A. and B. can do, all the rest of the alphabet can do, and therefore monopolies have no existence. Every set of men that desires to associate for the purpose of trading, on the footing of a corporation, can have themselves recorded as such by the Legislature, unless there exist good reason to apprehend fraud. Such is the case, among others, with those who desire to associate for the purpose of opening places for trading in money, *to* which those who have a surplus can bring it to be exchanged for securities, and *at* which those who have securities can apply for the purpose of converting them into money: money-shops, or banks—places quite as important for those who desire to have securities and money fitted to each other, as shoe-shops to those who desire to have shoes fitted to feet, and feet fitted to shoes—*and quite as harmless.* Such being deemed to be the case, it is not thought necessary to subject the parties associating for the purpose to any liabilities, or penalties, that need prevent prudent and cautious men from taking part in their formation and management. The consequence is that there are distributed throughout those two States nearly 200 money-shops, constantly engaged in the collection and distribution of capital, owned by the people of the neighborhood, who themselves manage their own property, and are not compelled to transmit it to Boston, to be managed by others of whom they know but little; the general result of which is, that the trade in money is attended by less loss to those who deal with banks, and more uniform, steady and moderate profit to those who own them, than in any other part of the world. Throughout both States, every man is within reach of a money-shop; and the industrious and prudent farmer, shopkeeper or mechanic can at any time command small loans to aid him in his business. In no part of the world does capital distribute itself so equally—falling almost like the dew, and fertilizing where it falls; in none is there a currency so inexpensive, and in none is the quantity of currency so little liable to fluctuation. The system is almost perfect, because almost perfectly free; and it would be difficult to suggest an improvement, unless it were the passage of a general law that should relieve the Legislature from all necessity for interference in any way, while sweeping away the few remaining regulations, some of which seem to indicate a personal liability that has no real existence, and thus to make it as free in appearance as it is in reality.

Pennsylvania, on the contrary, is the land of monopolies. Equality of rights is unknown. A. B. and C. are perpetually obtaining the *privilege* of doing things which to the rest of the alphabet are forbidden. Large associations obtain grants of charters which to small ones are denied. On one day a bank of five or thirty-five millions is organized in the city, and on the next the citizens of a large agricultural district, suffering for want of a little money-shop, are denied the exercise of the right of making one, unless they will assume enormous liabilities. Of late years, association, the great characteristic of the age, and of civilization, has come to be considered anti-democratic, and the perfection of democracy is thought to be realized in the form of wealthy private bankers and manufacturers, deemed highly preferable to unions of little capitalists, employers and workmen, such as are seen

to exist at Lowell and elsewhere in Massachusetts.* To prevent association, pains and penalties are devised, and thus, if a thousand people desire to create a shop at which money may be exchanged for securities, or a factory at which cotton may be converted into cloth, it is held to be necessary that *each of the thousand*, having an interest of $100, and entitled to claim, at the most, a dividend of six or eight dollars per annum, shall be responsible for *all the debts* of the concern, because entitled to receive *the thousandth part of the profits*, although the whole capital, amounting to $100,000, must be sunk before any creditor can lose a dollar. Prudent men know that a well-managed bank, or factory, cannot, on an average, divide more than 7 or 8 per cent.; they know that they can obtain six per cent. on mortgage, *without responsibility of any kind;* and they likewise know that mortgages on city property are more readily realized, and the interest thereon more punctually paid than on country mortgages; and thus everything tends to the transfer of capital to the cities—whereas if legislators could but open their eyes to the fact that men understand their own business, and are more competent to determine for themselves the proper mode of trading with each other than their representatives at Harrisburg are to do it for them, the farmer's capital that now goes to Philadelphia for the purchase of bank stock or mortgages would remain at home, benefiting those who desire to borrow; and, in a much greater degree than at present, those who are able to lend. A large portion of the State is at this moment deprived of all the advantages that would result from the establishment of places for the exchange of money and securities for each other, and the owner of capital is compelled to intrust it to the management of people at a distance, when he would prefer to keep it at home, while his neighbor's farm or work-shop is unproductive because unable to obtain occasional small loans to enable him to purchase stock, lime, &c., or to make improvements that are needed.

What is here said of Pennsylvania is equally true of most of the States south and west, all of which seem disposed to vie with each other in imposing restraints on the trade in money, the most important of all trades, and equaling in amount all others put together; as every exchange of commodities is made at a money price, and involves the necessity of a contract for the delivery of its equivalent in money.

You ask why land in Maryland, Virginia and South Carolina has so little value when compared with that of England or of France. To obtain an answer to this question we must first determine what is the cause of value in land. Of itself it certainly has none, as can be seen in the fact that thousands and tens of thousands of acres of the most fertile lands in Texas have been given to individuals on condition of settlement, and that when partially settled they could not be exchanged for half as much as they had cost. Such was the case with those granted to William Penn, and to all others of the early settlers of these United States. The lands of Iowa and Wisconsin have, in part, attained a value of $1 25 per acre because of a great expenditure of capital in the formation of roads and canals leading from the lakes to market, but they are in many cases dearer, fertile as they are, at that price, than lands in Pennsylvania or New-York at $80 to $100 per acre. Clear and inclose them, and give them roads and canals, and they will gradually acquire farther value, rising with the growth of wealth and population, *but never equal in amount to that of the labor that has been expended upon them*

* "LOWELL, Feb. 24, 1847.—Hon. A. STEWART: *Dear Sir*—Your favor of the 18th inst. is received, and I am happy to furnish you such facts and information as I possess touching the subject of your inquiries. It is a fact that hands who work in our mills are, many of them, stockholders. It is the case to a greater or less extent in all our companies here. In the Middlesex (woolen) there is about $60,000 of its stock owned by men who work in their mills. In the Merrimack yard there are thirty men who own stock, say about $60,000. There are several who own in the concern under my charge. The stock of these companies, as a general thing, is held in small sums, say a few thousand dollars each. It is constantly in the market for sale, and any person can purchase who has the means. It is considered a desirable investment for widows and orphans, and clergymen, because they receive the benefit of the sagacity and skill of the best business men of the country. These corporations, with their hundreds of stockholders are much more democratic, far easier of access to men of small means, than the association of individuals as co-partners. It is associated wealth, accessible to any person who has the amount of one share, which may be $100 or $1,000, as the Legislature that grants the act of incorporation may judge proper. What is there in all this that looks like monopoly or favor to the rich capitalist? With my hundred or thousand dollars I can purchase a share which will give me the same per cent. on my one share, that my rich neighbor who has his hundred shares receives.

"There is nothing about it exclusive. The man of very small means is enabled to invest and realize a benefit from wealth and skill which he could obtain in no other way. Yours, very truly, H. BARTLETT."

—a fact universally true, and carrying with it abundant evidence that land owes all its value to the labor applied to its improvements.*

Men who are willing to work seek Illinois, Wisconsin and Iowa, and each takes a piece of land that he is to render valuable by means of his labor, and that constitutes a sort of little savings box, in which he deposits all his wages over and above what is absolutely necessary for the support of himself and his family, as well as all the spare hours and half hours that would otherwise be unemployed. Every additional deposit therein tends, as with children who have penny-boxes, to increase his desire of accumulation, and to increase the habit of industry and economy. With the growth of population, the number of these little savings banks is steadily increasing, and by degrees a wealthy community arises, the members of which, by combining their means, are enabled to create money-shops at which poor but honest and industrious men can obtain loans, while applying other portions of those means to the construction of turnpike roads, and ultimately railroads or canals. Wealth attracts wealth; and every new house, or town, or city, or road, whether of stone or of iron, tends to bring new laborers and to produce new divisions of land, new houses, and new savings boxes, and to cause the construction of new roads and canals. In the South these little savings boxes have no existence. The laborer has no property, and has no inducement to exertion, and his master has no economy. The land is exhausted, and deteriorates in value until at length both laborer and employer are compelled, if they would continue to live, to run away from it. In the first case we see the attractive power of wealth, while the second exhibits the repulsive power of constantly increasing poverty. Population diminishes, and land loses the little value it once possessed.

The people of the South burn the candle at both ends. They offer no inducement to economy or exertion on the part of those who labor, and they despise labor too much to acquire, themselves, the habit of employment, by aid of which they would become economical. In New-England, all work and all spend liberally in proportion to their means; but there is very little waste of either labor or capital. The results of these different modes of action are widely different. The southern planter is like the elephant, who leaves behind him scarcely any record of his existence; while the Yankee resembles the coral insect, whose labors and habits of association are attested by the formation of extensive islands destined, perhaps, at some future time to be combined, by the farther labors of these industrious creatures, into a vast southern continent. Were the people, *white and black*, of South Carolina swept away, what would remain to give value to the lands? Almost nothing! Compare, I pray you, the condition in which their successors would stand, with that of an equal number coming at once into possession of Massachusetts, with its towns and cities, its factories and ships, its turnpikes and railroads, and then answer for yourself the question "Why it is that land in the South is so nearly worthless?"

Mr. Calhoun holds that South Carolina exhibits to the world a model of society the most perfect that exists. If other people thought so, there would be an influx of population and of wealth. *If his countrymen thought so themselves they would not run away from it as they do.* If it were really so, there would be a gradual diminution in the size of farms or plantations, and an increase in the number and quality of houses, whereas the present tendency is directly the reverse. If they wish to continue their society in its present state of perfection, they must resign themselves to constantly increasing depopulation and poverty. If, on the contrary, they desire their lands to become valuable, they must make it the interest of the laborer to work and to economize, by securing to him the enjoyment of the results. They must teach *the people* to make saving funds by aid of which, eventually, railroads and canals will be constructed; and nothing will be done to render property valuable until *the whole people* shall have acquired an interest in exerting themselves for the accomplishment

* The United States are the largest landholders in the world, and they obtain their land on the lowest terms. Nevertheless, they would be ruined by the ownership were it not for their entire exemption from contributions, in the form of taxes, toward the improvement of their own property. They sell the best lands, and the purchasers pay the taxes thereon for making roads and building court-houses, while making private contributions for churches, &c. &c., and thus the second, and third, and fourth qualities gradually acquire value equal to $1 25 per acre, and are sold. But for this, the public lands would bankrupt the Treasury, although obtained originally for almost nothing.

of that object. When this shall come to be done, wealth and population will increase and emigration will diminish; but until it shall be done, the former will diminish and the latter will increase, as will be proved by every day's farther experience. The sooner they satisfy themselves that slavery, although bad for the slave, is worse for the master, and adopt measures for *permitting** the gradual extinction of the system, the sooner will land acquire value; but until that time shall come, the tendency will be rather downward than upward.

I have thus endeavored to furnish the answers you desired, and now remain

*March* 6, 1847. Yours, very truly. C.

## CARCASS WEIGHT OF SHEEP.

From the nature of the covering of sheep, it is only when these creatures are recently shorn of their fleece, that dimensions for ascertaining their carcass weight can be taken with accuracy; and, in so small an animal as the sheep, any inaccuracy in measurement would lead to much too great a proportional discrepancy to the true carcass weight to be of practical utility. The following observations will therefore be confined to the proportion of carcass to the weight of the animal alive.

The proportion of mutton to the live weight of sheep is somewhat, but not greatly, different to that of the carcass weight to the live weight of neat cattle. The specific gravity of mutton is less than that of beef: so far the proportion of the carcass to the live weight of sheep will be less than the proportion of the carcass to the live weight of oxen; but, when sheep are in a fat state, the thickness of their flesh, in proportion to their size, is greater than that of oxen, the difference being fully equal to compensate the less density of mutton. The offal of sheep is lighter in proportion to their live weight than that of oxen, excepting when sheep are in wool, at which time their skins proportionally exceed the hides of beasts. So that, when the greater thickness of flesh and small general offal is set off against the less density of mutton and the fleece, the analogy found to exist between the proportion of mutton to the live weight of sheep, and that of beef to the live weight of oxen, is not surprising.

From the experiments I have made, I do not find that so much depends upon *breed* in causing a variation in the proportion of mutton to the live weight of sheep, as I have found to be the case with respect of beef to the live weight of cattle. In sheep, when newly clipped, I have found a very close uniformity in the proportion of mutton to live weight of different breeds in equal condition, so much so that I have reason to believe that the only difference from breed arises from the greater or less fleece of wool peculiar to any particular kind of sheep; at any rate, the difference from breed, independent of the difference of the weight of fleece, is too insignificant to require classification as in the case of oxen. The breeds of sheep on which I have had most opportunities of making observations are the Leicester, the Cheviot, the Black-faced mountain sheep, and crosses of the Leicester with both of the latter breeds. I have not made any experiments myself on the proportion of mutton to the live weight in South-Down sheep; but I do not apprehend that there will be any difference between them and Leicester sheep in equal condition, excepting so far as the proportion may be affected by the difference in the weight of fleece.

The subjoined Table shows the proportion of mutton to the live weight of Leicester sheep—namely, when in the wool after Christmas, and in summer when recently clipped:

| Live weight of Sheep in stone, 14 lbs. avoird. | Per cent. of Mutton. In wool. | Newly shorn. |
|---|---|---|
| Above 20 | 71 to 72 | 75 |
| 19 to 20 | 69 to 70 | 73 to 74 |
| 17 to 19 | 67 to 68 | 71 to 72 |
| 16 to 17 | 66 | 69 to 70 |
| 14 to 16 | 64 to 65 | 67 to 68 |
| 12 to 14 | 62 to 63 | |
| 11 to 12 | 60 to 61 | 64 to 65 |
| 10 to 11 | 59 | |
| 9 to 10 | 57 | 62 to 63 |
| 8 to 9 | 55 to 56 | 60 to 61 |
| 7 to 8 | 53 to 54 | 59 |
| 6 to 7 | 51 to 52 | 57 |
| 5 to 6 | 50 | |

* I say "permitting," because I would desire only to see the majority of the people of the South granting to the minority *the right to do what they like with their own*, and emancipate them if so disposed. I have no desire to see any interference with the right of property.

EXAMPLES.—The following were five extraordinary fat two-year-old Leicester wether sheep, fed by the Duke of Northumberland, and slaughtered by Mr. March, of Greenside, near Gateshead, in the county of Durham, in January, 1846:

| | | st. | lbs. | st. | | st. | lbs. | | | st. | lbs. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1. | Live weight, | 24 | 3 | or 24·2142 ·72 | | | | | | | |
| | | | | 17·434224 | or, by table, | 17 | 6 | Actual dead wt. | | 17 | 6 |
| 2. | .. .. | 22 | 12 | or 22·8751 ·72 | | | | | | | |
| | | | | 16·470072 | .. | 16 | 6½ | .. | .. | 16 | 10½ |
| 3. | .. .. | 22 | 0 | or 22 ·72 | | | | | | | |
| | | | | 15·84 | .. | 15 | 12 | .. | .. | 16 | 1 |
| 4. | .. .. | 21 | 6 | or 21·4285 ·71 | | | | | | | |
| | | | | 15·214235 | .. | 15 | 3 | .. | .. | 14 | 4 |
| 5. | .. .. | 19 | 11 | or 19·7857 ·70 | | | | | | | |
| | | | | 13·849990 | .. | 13 | 12 | .. | .. | 14 | 3 |
| | | | | | | 78 | 11½ | | | 78 | 10½ |

The quantities of tallow severally yielded by these five sheep were as follows, viz.:—Nos. 1 and 2, 1 st. 4 lbs. each; No. 3, 1 st. 2½ lbs.; No. 4, 1 st. 8 lbs.; and No. 5, 10½ lbs.: showing 1, 2 and 3, very good provers; 4, an extraordinary prover; and 5, but an indifferent prover. The fleeces of all of them were quite ripe.

The following was a two-year-old Leicester wether sheep, in fair condition, killed by Mr. Robert Story, of Newcastle-upon-Tyne, May 21, 1846:

| | st. | lbs. | st. | | st. | lbs. | | st. | lbs. |
|---|---|---|---|---|---|---|---|---|---|
| Live weight, | 9 | 3 | or 9·2142 ·57 | | | | | | |
| | | | 5·252094 | or, by table, | 5 | 3½ | Actual dead weight, | 5 | 2 |

The following was a ewe, half-bred between Leicester and Cheviot, killed by Mr. William Hawksby, of Newcastle-upon-Tyne, in April, 1846:

| | st. | lbs. | st. | | st. | lbs. | | st. | lbs. |
|---|---|---|---|---|---|---|---|---|---|
| Live weight, | 6 | 9 | or 6·6428 ·51 | | | | | | |
| | | | 3·377828 | or, by table, | 3 | 5½ | Actual dead weight, | 3 | 6 |

The foregoing examples are not selected particularly as a test of the accuracy of the scale of proportions laid down, as many instances can be given for such a purpose quite as close to the actual dead weights as those above; but as the particulars of the live and dead weights of the first five are recorded in the public prints, probably furnished by Mr. Patten, the Duke of Northumberland's agent (vide *Newcastle Journal*, May 16, 1846), they may be referred to; and as both the live and dead weights of the last are registered in the book kept at the public weigh-house, in the butchers' market at Newcastle, it is also an instance on public record. The examples given above will serve to show the application of the scale of proportion to *sheep of extraordinary weight*, to *those of a general character*, and also to *sheep of a very shabby description*. [The (London) Plough.

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"EXPERIMENTS IN THE FIELD."—In the published proceedings of an Agricultural Association in England, attention has been drawn to the refuse matters of bleach-works, as well as to other waste materials; and experiments have been suggested for testing their value to the practical farmer. A letter has been received from Mr. Pringle, at Ingram Farm, near Lisburn, in Ireland, describing some interesting and successful experiments of this kind, in which the waste leys of a bleach-work were found very advantageous, in conjunction with farm-yard manure, in promoting the growth of turnips. The subjoined results are deduced from the statement in the letter, as having been obtained from the experiments tried:

| | *Bulbs.* | *Tops.* |
|---|---|---|
| Dung alone | 17 tons 5½ cwts. | 8 tons 14 cwts. per acre. |
| Dung and guano | 26 " 18½ " | 8 " 1½ " " |
| Dung and waste leys | 33 " 12½ " | 7 " 12½ " " |

"The interesting difference in the weight of the tops, when the leys were used, appears to be connected with the large quantity of alkaline matter contained in the waste liquor; and, so far as the experiment goes, the liquid seems to influence the growth of the plant more in the bulb than in the leaf—a very important fact, if farther trials should confirm it."

# THE NEW-YORK STATE AGRICULTURAL SOCIETY:

## ITS NEXT EXHIBITION.

As will be perceived by the following communication from its zealous and estimable President, that the next Annual Exhibition is to take place at *Saratoga Springs*, on the 14th, 15th and 16th of September, 1847. The premiums offered in money and other forms exceed $3,000; and it is not a little gratifying to see that the rules for the guidance of all competitors for premiums have been drawn up evidently with much and suitable deliberation and care. One requisition only seems to us to be repugnant to every idea of the character that we would hope belongs to the very occupation of a free-born American *husbandman*. We refer to the *requirement of an oath or affirmation* to the truth of statements made in all cases of any consideration, where the award of the premium must depend more or less on the personal veracity of the competitor. It were to be hoped that in such a case the moral sense of the community must be so fixed, so universal, so well understood, that the certainty of universal scorn and detestation would be all-sufficient to deter any man, if any man (of course we do not say gentleman) could be found into whose contemplation the idea of willful deception or fraud could find its way on such an occasion. Any man who should be found guilty of any attempt at deception would, we may presume, be at once stigmatized as a black sheep, and so marked as to become "a fixed figure for the time, for Scorn to point his slow, unmoving finger at," wherever he should show himself.

It would not be easy to find a more convenient or suitable place for this great exhibition of the industry of the State; and even without any express stipulation on the part of the proprietors of the public houses there, the public would have had, we think, in their character, a sufficient guaranty against the disposition, mean as it was mercenary, which has prompted the proprietors of such establishments in some other places to practice the most infamous extortion, to the disgust of all liberal minded strangers and the scandal of the towns that support them. The hotel keepers, *except one*, have pledged themselves to specific charges.

For ourselves, we here bespeak, in time, a room in old "Congress Hall," where for more than a quarter of a century we have found, "in the season of the year," excellent fare, kind attention and genteel, intelligent, safe and quiet company.

For The Farmers' Library.

## NEW-YORK STATE AGRICULTURAL SOCIETY.

Agricultural Rooms, Albany, April 8, 1847.

The Executive Committee have the satisfaction to announce to the Agriculturists of the State, that our distinguished fellow-citizen, Hon. Silas Wright, has accepted an invitation tendered to him to deliver the Annual Address on the Fair ground at Saratoga on the 16th of September next.

It will doubtless have been perceived from the published proceedings of the Executive Committee, that they have, in accordance with the recommendation expressed by the Society at the Annual Meeting in January, located the Cattle-Show and Fair at Saratoga Springs, to be held on the 14th, 15th and 16th of September, 1847.

A Delegation of the Committee visited Saratoga, and selected a fine, elevated plat of ground, within a quarter of a mile of Congress Spring, containing an area of fifteen acres or more, which will be inclosed. Spacious buildings will be erected within the inclosure, with ample accommodations for all articles presented for exhibition.

Care will also be taken that arrangements on an extensive scale, appropriate to the occasion, be made for the reception and exhibition of every description of stock, farm implements, articles of domestic manufacture, fruits, flowers, and articles of mechanic skill, &c.

Arrangements will be made with the several railroad companies for the gratuitous transportation of stock, as well as other articles designed for exhibition, so as to arrive a day or two previous to the first day of exhibition.

The two railroads leading to Saratoga will be in readiness to transport, without hindrance or delay, the visitors who may desire to be present on the occasion.

B. P. Johnson, Secretary. GEO. VAIL, President.

# FATTENING CATTLE.

## A DISSERTATION ON THE PHILOSOPHY OF FATTENING CATTLE....PART I.

Next to understanding properly the chemical analysis of soils, the application of proper manures, and the crops which should be grown from the land by proper tillage, there are but few subjects more deserving the attention of the practical agriculturist than a knowledge of the proper connection which exists and should be duly preserved between the members of the animal and vegetable kingdoms. As I observed in my Lectures on the "Philosophy of Agriculture," so may I now repeat, man is an omnivorous animal—he is destined by the Almighty, who has so created his masticatory and digestive organs, that he can live and flourish under a compound diet of animal and vegetable food; we are also told, by Divine authority, that "*man shall not live upon bread alone;*" consequently, as it is necessary that he should have recourse to substances of a different nature to use in combination, so is it equally of paramount importance that he should direct his care, skill, knowledge and attention to the management of cattle, so that they should be able to afford him the greatest possible amount of nutritious food, and at the least possible expense in money to himself, and waste or loss, or both, in the preparation of the same.

It is my intention in the present Lecture to make a few observations on this subject, to show you the wisdom that experience has taught us, and which I have drawn from many sources, the results of the labors of practical men. To some I may have the pleasure of addressing, the theme I shall discuss may be novel; while I doubt not that many who are here present will be able to confirm many of the truths which I shall utter.

The existing link between animals and vegetables forms one of the most beautiful chains in Nature, and one which cannot be dissolved; it is one of the greatest value to the practical farmer, because it so materially affects his operations in the breeding, rearing and feeding his cattle.

In considering this subject philosophically, we must first of all examine what are the substances which enter into the office of nutrition, and ascertain by what means, as far as our limited knowledge extends, nourishment is afforded to the animal. The vegetables upon which not only cattle but ourselves are fed consist of two portions, viz. an organic and an inorganic; and, upon instituting a chemical analysis, we find that the organic is chiefly composed of a considerable quantity of water, much carbonic acid in combination with the salts of ammonia, and nitric acid; the inorganic portion is entirely derived from the soil from which they grow, and the science of Chemistry informs us that it consists almost entirely of the various saline constituents, and earthy particles, which, upon incineration or burning, constitute the ashes of the plants. I refer you to what I stated in my Lectures on the Philosophy of Agriculture, as to the manner in which these particles are absorbed by the plants, and which you will find published in Nos. I. and II. of "The Plow," detailed at length; but I may here briefly remark that these substances are taken into the texture of the vegetable by means of the leaves and roots, which, under the chemical action and influence of the light from the sun, are decomposed—the oxygen becoming returned to the atmosphere which originally gave it; while the elements of water, with the carbon, unite to form starch, sugar, gum, or woody fibre, and with the elements of ammonia or nitric acid, constituting albumen, casein, or gluten. Thus, the plant derives its food almost entirely from the inorganic kingdom, while the animal, on the contrary, from its anatomical conformation, can only exist upon organic matter.

During the present century, such great discoveries have been made in the science of Organic Chemistry, particularly by the discoveries of the late Sir Humphry Davy, Dr. Edward Turner, Professor Brande, Drs. Faraday and Gregory, and last, though not the least, that of Baron Justus Liebig, of Giessen—to which may be added the labors of a rising young chemist, Dr. Lyon Playfair—that much valuable knowledge has been imparted to the philosophical and agricultural world, upon the physiology of animal life, and the manner by which the system is nourished and supported.

We now, therefore, can well comprehend why one species of diet is found to possess a greater quantity of nourishment than another—why the inhabitant of the frozen regions of the North, as I have seen in the persons of the Esquimaux and Greenlander, should require great quantities of train-oil with his daily food. And why? His stomach will digest the rancid flesh and blubber from their whales and seals, while the same species would not only be disgusting to us, but actually prove both physically and mentally injurious to the inhabitants of more congenial and warmer climates. We also understand from the same source how it is that we cannot feed animals or exist ourselves upon a diet wholly composed of sugar, starch, gum, or gelatine; and yet, although we cannot live upon any one of these substances, yet when they are all

properly combined, strange as it may appear to some, it is of all these materials, when properly united, that our daily food is composed. The great office of Chemistry, as applied to this department of human knowledge, is to point out the peculiar wants of animal bodies, and how these are duly supplied in the food we and they daily consume. Anatomy informs us that, like the vegetable, an animal body is composed of two portions: the organic particles form a considerable portion of the flesh or softer tissues of the body; and also an inorganic portion, which Professor Berzelius, of Stockholm, Guy Lussac, Vauquelin, Thenard, and Fourcroy, with Dr. Magendie, of Paris, and other experimental chemists, have demonstrated also to constitute a small portion of the softer parts; but it is in the bones, which constitute the skeleton, that they are principally found; and these are directly derived in the *herbivora* (or vegetable-feeding animals) from the vegetable diet upon which they subsist, while the *carnivora* (or flesh-eating tribes) obtain it indirectly from the blood and flesh of the herbivorous animals upon which they prey.

These remarks naturally lead us to a proper consideration of those substances which form chiefly the food of those animals which are bred, reared and supported by the former, either for agricultural labor or as food for man, and in many cases for both—strange to say, they are principally herbivorous in their nature. Examine chemically, therefore, any article which they consume—no matter whether it is wheat, beans, peas, cabbage, carrots or turnips—we shall soon find that, besides water, it has gum, sugar, starch, and a considerable quantity of woody fibre, in union with a small portion of a fatty matter; all these constituents, as I observed in my former Lectures, will be found to be composed only of three elements, viz oxygen, carbon and hydrogen, which exist combined in nearly the same proportions. But we likewise find that there are many other substances contained in vegetables which contain nitrogen, and this is in addition to those elements which compose starch, gum, &c., and are known to the chemist by the appellations of gluten, vegetable albumen, and casein. Now if we take a small quantity of fine wheaten flour, and mix it with water into a paste, and well wash it upon a sieve, by pouring a stream of cold water over it while it is kneaded with the hand, all the sugar, starch and gum will pass away through the sieve with the water, and the substance left behind will resemble bird-lime, being of an equally tenacious nature; this is, therefore, the gluten which the wheat contained; and when dried, the water it possessed being evaporated, it resembles horn, being a hard, brittle mass, and if burnt it emits a similar unpleasant effluvia to burnt horn, feathers, or other animal matter. The gluten which is obtained from peas, beans, or the fibrin and vegetable albumen procured from the expressed juices of the carrot, turnip or cabbage, all possess analogous properties to those found in wheat, with this exception, that they are all soluble in cold water, whereas the gluten which is obtained from wheat is not. If we submit these substances to the test of chemical analysis, we speedily discover them to be all composed of the same constituents, and also that they are likewise identically the same as those composing the flesh and blood of animals generally; but you must please to bear in mind that this remarkable identity does not consist in their containing azote or nitrogen in combination with oxygen, carbon and hydrogen, in the same or nearly the same proportions as in animal flesh and blood, but it extends to the existence of a small quantity of sulphur and phosphorus, which is found to be associated with the muscular flesh forming one of the soft tissues of the animal. Hence we may very properly assert, as a physiological axiom, that the blood and flesh are, by the Great Author of Nature, found actually ready prepared and elaborated in the vegetable. The plant it is which elaborates and duly prepares all the elements of water, carbonic acid, and ammonia, which constituent particles are found to be identically the same as the muscular animal flesh; consequently, the animal has nothing more to do than to apply them to his own use for the purposes of nutrition, secretion, and the vivification of life.

The following Table, adopted by my talented friend, Professor Gyde, of Painswick, will give the reader an idea of the actual identity of composition existing between these substances:

TABLE I.

| Elements. | Gluten from Flour. | Casein from Peas. | Ox Blood. | Ox Flesh. |
|---|---|---|---|---|
| Oxygen, | 22·4 | 23·0 | 22·2 | 22·3 |
| Hydrogen | 7·5 | 7·2 | 7·5 | 7·5 |
| Carbon, | 54·2 | 54·1 | 54·3 | 54·1 |
| Nitrogen, | 15·9 | 15·9 | 15·8 | 15·7 |

Every animal body momently undergoes some physiological change; every motion, thought and action is of course performed at the expense of some, and many of almost every part of the body; these incessant alterations and action cause the great demand for food, which Nature constantly requires to repair the waste that is continually taking place. You may speedily ascertain the truth of this fact, by noticing its illustration in those animals who have long been kept without food, or had but a scanty supply, or where it did not possess sufficient nutritious properties; and also in those animals who have undergone great exertion and bodily fatigue, when contrasted with those but little fatigued, and whose food was good in quality and sufficient in quantity. The fine horses formerly attached to our well-appointed coaches, before the construction of railroads and the employment of giant steam-power, and which vehicles will ere long only be remembered by being recorded in the pages of history among

the phenomena that have been and are passed away—the fine horses I have named were almost exclusively fed upon oats and beans, which are two of the most nutritious kinds of all species of vegetable food; while, on the other hand, those horses performing but a small amount of laborious work, will supply the natural waste of their bodies from the very small comparative quantity of gluten which is found to be contained in hay or clover, or both.

I have already informed you that the food of classes of animals consists of two kinds of distinct species of matter; viz. the one which possesses a great proportion of azote, or nitrogen, as one of its principal constituents, and which the Table I have referred to tells us is identical with the blood and muscular flesh of the animal: the other portion is destitute of nitrogen, but consists of gum, starch, sugar and woody fibre. Now, every one of these different materials answers two quite distinct but very important purposes in the economy of every animal body. The first, or the nitrogenous constituents, supply the waste which has occurred in the fluids and tissues of the body, and, as Dr. Magendie very properly states, may justly be termed the elements of nutrition; the last, which are the non-nitrogenous portion, act, if I may apply the expression, as fuel for combustion in the lungs, in order to keep up the due supply of animal heat, and under some peculiar circumstances also will contribute to the formation of fat.—These elements may likewise be arranged under two great heads, viz. those which are necessary to the function of nutrition, and those affecting that of respiration.

I respectfully call your attention to the following Table, wherein they are exemplified:

TABLE II.

| 1. Elements of Nutrition. | 2. Elements of Respiration. |
|---|---|
| Gluten. | Gum. |
| Albumen. | Starch. |
| Casein. | Sugar. |
| Flesh, or Muscular Fibre. | Oil or Fat. |
| Blood. | Alcohol. |

The elements of nutrition (No. 1) must of necessity exist in combination with every substance which experience has taught us to be capable of supplying food to the animal; but, ere it can impart the nutritious properties, numerous important mechanical and chemical changes must undergo, ere it can take place. The grand process of digestion must be performed—by which I mean, the manner by which the nutritient particles may be rendered soluble, and not only capable of entering, but even of forming new blood. A brief detail of the manner in which this is performed may not be uninteresting to some of my present auditory. It is accomplished in the following manner: The food, when received into the mouth, is broken down by the teeth, where it becomes mixed with the saliva, which is secreted by the glands that are situated near the angle of the jaw, and beneath the tongue; when the process of mastication is completed, the morsel is collected into a ball at the base of the tongue, and by the act of deglutition or swallowing it is carried past the pharynx into the œsophagus or gullet, down which it passes into the stomach, where it enters at the cardiac orifice; it remains there for a short time, according to the nature both of the animal and the food it has partaken of, (in man it is supposed to be about two hours.) The chemical and mechanical action that now takes place is technically called, in physiological language, the process of *chymification*; when this is perfected, the orifice at the opposite extremity (denominated the pylorus) becomes dilated, and the chyme passes into the first of the small intestines, anatomically named the *duodenum*, where it becomes mixed with the bile from the liver, and the fluid from the *pancreas* or sweat-bread. This being accomplished, the process of *chylification* now commences—a series of small, minute vessels, named lacteals, whose mouths open on the mucous (or villous) coat of the bowel or intestine, which absorbs the nutritious portion of the food, (which resembles milk in appearance, hence it is named *chyle*.) This fluid, being conducted by numerous branches, passes into one great reservoir, called the *thoracic duct*, which ends in a large vein near the heart (the left subclavian), and there it is mixed with the blood; but being loaded with carbon, which is inimical to the due preservation of animal life, the blood passes from the heart to the lungs, where it becomes oxygenized, and fit for all the purposes of the animal economy. The non-nutritious portion, from which the chyle has been extracted, passes through the last of the small intestines *(the jejunum)* into the whole course of the larger part of the alimentary canal—viz. the *cæcum*, *colon* and *rectum*, and from the last they are finally ejected from the body—ultimately again to reënter it in another form, in consequence of its forming manure, and therefore affording food for plants in the manner detailed in my former Lectures.

But independent of the simple fact that the salivary fluid, when commixed with the food, renders the digestion of the aliment far more easy, yet Baron Liebig imagines that it possesses the peculiar offices of inclosing and combining air, in the form of froth; the oxygen which it contains enters into union with the constituents of the food, while the nitrogen is again evolved through the medium of the lungs and skin; this philosopher is likewise of opinion that, in many of the herbivorous quadrupeds, their rumination (as the oxen and sheep, for example) has for one of its principal objects a complete renewal with the repeated introduction of pure oxygen into the animal's stomach; and that, unless this takes place, the function of rumination cannot be duly perfected in the stomach. I have given you a brief outline of the manner in which digestion is accomplished, but in doing so I omitted to observe that attached to the mu-

cous or villous coat of the stomach are a series of minute glands, which secrete what is denominated the *gastric juice* or *fluid*, and which, among other matters, contains a quantity of pure *mucus*, in combination with a small quantity of *free hydrochloric* or *muriatic acid* (called in common language *spirits of salts*), with a peculiar principle known to chemists under the appellation of *pepsin*, and which has been affirmed by Dr. Sylvester, of Clapham, to be in itself a most active and virulent poison, but whose noxious properties are chemically neutralized in the stomach and intestines during the function of digestion.

I have stated that *hydrochloric acid* is always present in the stomach, and particularly so during the digestive process: for the discovery of this curious but important chemical fact, we are indebted equally to M. Tiedmann Gmelin (of Germany) and Dr. Prout, of London. This acid may be artificially obtained by the decomposition of chloride of sodium, or *common table salt* (which is only a combination of pure muriatic acid and soda); the acid is of great service in promoting the function of digestion in the stomach, while the soda, as an alkali, copiously enters into the formation of bile. Thus it is that a certain proportion of salt is necessary to digestion in every species of animals, at least as far as our knowledge extends in the classes of quadrupeds and birds; and, although Chemistry tells us that it is an essential ingredient in the burnt ashes of all vegetables, yet we very rarely find it existing in a sufficient quantity to form a regular supply of either the acid or soda which is required for the due performance of the function of healthy digestion; and, therefore, not only should we ourselves partake of a certain quantity daily with our own food, but should place some within the reach of both birds and cattle under our management in the farms we are connected with. Nature is the philosopher's best monitor, and the scientific farmer cannot do better than obey her axioms. We find that all classes of animals have, if I may use the expression, an instinctive love for salt, and seek for it as for a portion of their diurnal food. It is well known that the pigeon tribe of birds, if they cannot obtain it elsewhere, will even have recourse to the mortar which cements the bricks of houses together; they have been frequently known to fly to the sea-coast in order to procure it; and pigeon-fanciers who are not so honest as to mind *borrowing* their neighbors' birds, will allure them by means of what is known as a *salt cake*, placed in or near the dove-cote, wherein muriate of soda forms an essential ingredient; this nefarious practice is now forbidden, very properly, by an act of Parliament, which awards a punishment of seven years' transportation upon conviction; it however confirms the important physiological fact I have just noticed.

In the ruminating tribe of the class *Mammalia*, as the ox and the sheep, the important process of digestion differs but little from that which I have stated, and whose stomachs are of the simplest construction, being little else than a mere membraneous bag; but in the *Ruminantia*, we find their stomachs considerably more complicated, in order that they may be enabled to extract the due proportion of nourishment which they require from the food which they eat; as in the case of grass, by way of example, which we find by chemical investigation contains but very little nourishment in proportion to the bulk. Let us now philosophize for a moment, and see the manner in which the ox and those of his class perform the functions of mastication and digestion. In these creatures, the grass is cropped from the surface of the earth by means of the fore-teeth, and after being but very slightly masticated, is swallowed; this process continues until the first stomach is filled,* when the animal lies down apparently well and perfectly contented; but it is now that the curious process of rumination commences. In the first stomach, the food is mixed with a secreted fluid not dissimilar to the saliva, and in a kind of semi-pulpy mass it is returned into the mouth, in small detached portions, where perfect mastication takes place, and during this process the animal is in a recumbent position; after the second and perfect mastication is completed, the food passes into the second stomach, denominated by comparative anatomists *omasum;* from this it passes into the third stomach, the *abomasum;* in these last two, it undergoes very important changes, and whence it passes into the fourth or really true stomach. It is in this last portion of the curious but complicated species of apparatus, that the function of digestion is ultimately and perfectly performed; and the last processes of extracting the nutriment from the food are exactly similar to that which I have described as occurring in man and those animals having simple membraneous stomachs. The vital fluid of all animals is commonly denominated the blood, in which, as Holy Writ truly observes, "*is life;*" this fluid is either formed from vegetables, as in the *Herbivora*, or from flesh, as in the *Carnivora;* yet in both tribes of animals the composition and essential constituents are the same, both in their physical effects upon the system, and as portrayed by chemical analysis. We find it circulating throughout not only the principal organs in the living animal, but by means of vessels as fine as the human hair: so extremely delicate are they that they will not admit the thicker coloring particles of the blood itself; yet the properties which the blood possesses are most surprising; it replenishes the fluids and solids which are diminished by the waste, wear and tear of the body; it places osseous or bony matter in the skeleton for its growth and support;

* We should here observe that the Lecturer exhibited drawings of the stomach, as found in both tribes of animals.

forms fleshy fibres for soft muscular tissue, by which the motions of the body are performed; and from the blood are all the different bodily secretions which are necessary for the healthy existence of the animal secreted and performed; the blood supplies carbon to the lungs for keeping up the animal heat, with fat and oily fluids deposited in the softer tissues as well as in the very substances of the bones themselves, as a store from which Nature can extract a due supply when necessity compels her; lastly, the blood is the true moving power by which the whole animal machine is put into motion, just as steam is to the steam-engine, and coals as fuel to the fire.

As far as I have proceeded I have only spoken of that part of the food from which animal flesh is naturally formed; *i. e.*, the gluten extracted from the vegetable, the albumen, and the casein: my self-imposed task, however, is not yet complete. I have now to take into consideration the offices which are fulfilled by the sugar, starch, gum, oil or fat, which we find, by examination, constitute so large a proportion of the food of man, and the principal of the lower orders of animals. Now, we find from observation, that every animal has a temperature above that of the surrounding atmosphere; and physiologists have denominated it the animal heat, which, in those animals domesticated by man, are found to be, on an average, about 100° of Fahrenheit's thermometer—in man it is about 97°, and we find that it continues much the same under every kind of circumstance, whether we live beneath a tropical sun, a more temperate region, or the frozen climes of the North.

The animal heat originates in the body; it is created by the chemical combination, or, if I may employ the term, the combustion of the elements which enter into the formation of starch, with the other non-nitrogenous constituent particles of the food, united with the oxygen of the air, which is received into the lungs during the function of inspiration; and likewise by a portion that is absorbed through the skin.

Upon examining the atmospheric air which we breathe, we find, upon submitting it to a chemical analysis, that it is composed of twenty-one parts of oxygen and seventy-nine parts of nitrogen, with so small a quantity of carbonic acid gas that its amount cannot be calculated in a given quantity of air; yet of course an immense proportion must exist, for it is supposed that the atmosphere extends forty-five miles at least in hight, and presses at the ratio of 15 lbs. upon every square inch: this was discovered by Torricelli and Galileo in the 17th century. However, when the air we have inspired has been expelled from the body, we find that it has undergone but little if any change; the oxygen, however, has disappeared, and been replaced by an equable quantity of carbonic acid gas, with a small quantity of aqueous vapor: the proportion of animal heat which attends this chemical change, is consequent upon the amount of carbon and hydrogen which is consumed. The heat which is thus produced is occasioned by exactly the same chemical action as that which causes the combustion of wood in a stove, or the fat of a lamp or candle, and the products of which are exactly the same: the carbon and the hydrogen of the food combine with the oxygen that is supplied by the atmosphere, and heat is generated in the body in proportion to the quantity which is consumed. In the stove or lamp the same changes take place, the fuel being composed of similar elements entering into the composition of the food; and the results of the combustion are precisely the same, the combination being less energetic in the body than in the stove or lamp.

Now, how is it in man? In a full-grown adult, if we take the weight of the carbon which is disengaged in the excretions, from the weight of the carbon contained in the food that is consumed during the twenty-four hours, we shall soon find that the remainder will amount to somewhere about fourteen ounces, and this is assimilated with the component parts of the body; the weight of which, however, does not increase, for it is a well known philosophical axiom, that fourteen ounces of carbon will require thirty-seven ounces of oxygen* for its transformation into carbonic acid, which passes off from the lungs and skin. Thus, in this simple manner, we can easily comprehend how it is that the enormous quantity of oxygen which is introduced into the animal body by the progress of inspiration, and the great proportion of carbon which is derived from the food consumed, are removed from the body; and likewise, how it is that the food required for supporting the animal in its normal condition is in exact proportion to the quantity of oxygen that is absorbed. Now, we find that a horse consumes daily, in his food, upon an average, eighty-nine ounces of pure carbon, and a cow seventy ounces; the former requires 212½ ounces, the latter 186¼ ounces of oxygen, in order to transform the consumed carbon into carbonic acid. I have already stated that, in addition to the constituents which I have named, the vegetable is found upon chemical analysis to contain a small quantity of fatty matter in addition to the earthy and saline substances of which it is composed. The question is now to be answered, What are the purposes which they answer in the animal economy? Every animal that is in a state of sound health has a layer of fat, which is situated between the skin and the muscles, and likewise between the muscles themselves, by which means they have great freedom of motion. Fat is also deposited in the body of the animal, particularly in the neighborhood of the bowels, also attached to a portion of them, and enveloping the kidneys, (where it

* One ounce of oxygen equals 1416·5 cubic inches.

is vulgarly called by butchers the suet). In the *Carnivora* or flesh-eating animals, the fat which is contained in the food they eat, is consumed in the lungs for the purpose of preserving the proper quantity of animal heat, and consequently, in these creatures, we but very rarely find the body of the carnivorous animal to contain much fat. M. Darwin, in his Journal of Researches into the Natural History of the Countries visited during the voyage of the Beagle, informs us that the Gauchos, or simple countrymen in the Pampas, South America, lived for months together upon flesh, but he observed that they ate large quantities of fat; and Dr. Richardson, in speaking of these people, has also remarked "that, when they have fed for a long time solely upon lean animal food, the desire for fat becomes so insatiable that they can consume a large quantity of unmixed and even oily fat, without nausea." This instinctive desire for fat in man and animals living on flesh arises from the imperative demands which are daily made upon the body for carbon to keep up the proper amount of animal heat, and which is contained in the fat that is consumed as an article of diet.

Thus far in the omnivorous and carnivorous animals; but in the herbivorous creatures it is widely different. The supply to the lungs is derived from the starch, sugar and gum in the vegetable, while the fat which exists in the food is in a great measure laid up as fat in the animal body; therefore it is that we find the bodies of the herbivorous quadrupeds generally much fatter than the *Carnivora*. But if the supply of the starch in the food is inadequate to the demands of respiration, then the elements of the fat become consumed in the lungs, exactly as it is in the carnivorous animal; the sugar, gum, and starch become speedily transformed into aqueous vapor and carbonic acid in the animal system: these are the first consumed; and, if this supply proves to be inadequate for the purpose required, then the fat, next the fat of the animal body, and finally the tissues themselves, are placed under contribution, the animal becoming thin, feeble, and emaciated, and ultimately dying from starvation.

['The (London) Plow.']

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CARROTS *versus* OATS.—We have had twenty communications from various sources, all of which concur in saying that a peck of carrots will, with the same quantity of hay, keep working-horses in as good condition, and many say better, than a peck of oats and a like quantity of hay; or that a peck of carrots and a peck of oats are equal to half a bushel of oats. 60 bushels of oats and 900 of carrots per acre are large crops.

| | | |
|---|---|---|
| Say to raise carrots you plow your land once oftener than for oats, at a high allowance for man and team | | $2 50 |
| Say it takes 12 days' labor to hoe the acre three times, and 4 days' labor to dry the crop—16 days at 75 cents per day | | 12 00 |
| Say additional manure for carrots, which, however, leaves the land the richer | | 10 50 |
| Total | | $25 00 |
| Say, then, you raise only 500 bushels of carrots per acre, at 35 cents per bushel | $175 | |
| Deduct extra cost of cultivation | 25 | |
| Produce of one acre of carrots | | $150 00 |
| Say you raise 40 bushels of oats per acre, place the seed of the two as equal, and that the straw of the oats pays for reaping and threshing, and you have 35 cents per bushel | | 14 00 |
| | | $136 00 |

clear gain, if you feed your carrots to your horses or cows.

Then strike off half again, and reduce your crop of carrots to 250 bushels, and still you have $68 against $14.

But what's the use of demonstration to men who never go beyond having "*a great mind to try it?*"

But another view: Can a greater disparity be thought of than the difference in *the labor* employed between getting a crop of oats and a crop of carrots?—the one the least, the other the most laborious, almost, in the whole circle of agricultural operations. So there are always "two sides to a story!"

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To FATTEN POULTRY.—Set rice over the fire, with skimmed milk; let it boil till the rice is quite swelled out, and then add a spoonful of sugar. Feed the poultry thrice a day in common pans, which must be kept clean to prevent sourness. Give them the milk of rice to drink. The rice gives a very delicate whiteness to the flesh. Animal food pounded very small is a useful mixture; and charcoal broken in small pieces increases the appetite and promotes digestion.

# ROAD MAKING.

We have been permitted to make some extracts, in advance of publication, from "*A Manual of Road Making*," by Professor Gillespie of Union College, which is to be published early in May by A. S. Barnes & Co. of this City.

From the "Introduction" we take some exemplifications of the great differences in economy, &c., between a good road and a bad one, as affecting the profits of Agriculture, and the gain to farmers in their improvement.

One important difference lies in the *grades* or longitudinal slopes of a road. Suppose that a road rises a hundred feet in the distance of two thousand feet. Its ascending slope is then one in twenty, and (as will be hereafter proven) one-twentieth of the whole load drawn over it in one direction, must be actually *lifted up* this entire hight of one hundred feet. But upon such a slope a horse can draw only *one-half* as much as he can upon a level road, and two horses will be needed upon such a road to do the usual work of one. If the road be intrusted to the care of a skillful engineer, and be made level by going round hills instead of over them, or in any other way, there will be a saving of one-half of the former expense of carriage on it.

Another great difference in roads lies in the nature of their *surfaces;* one being hard and smooth, and another soft and uneven. On a well-made road of broken stone, a horse can draw *three times* as much as he can upon a gravel road. By making, then, such a road as the former (according to the instructions in Chapter IV.) in the place of the latter, the expenses of transportation will be reduced to one-third of their former amount, so that two-thirds will be completely saved, and two out of three of all the horses formerly employed can then be dispensed with.* If such an improvement can be made for a sum of money the interest of which will be less than the total amount of the annual saving of labor, it will be true economy to make it, however great the original outlay; for the decision of all such questions depends on considerations of comparative profit. This part of the subject will be more minutely examined at the end of Chapter I., in considering "*What roads ought to be as to their cost.*"

The profits of such improvements are not confined to the proprietors of a road, (whether towns or companies remunerated for these expenditures by tolls,) but are shared by all who avail themselves of the increased facilities; consumers and producers, as well as road-owners. If wheat be worth in a city a dollar per bushel, and if it cost 25 cents to transport it thither from a certain farming district, it will there necessarily command only 75 cents. If, now, by improved roads, the cost of carriage is reduced to 10 cents, the surplus 15 cents on each bushel is so much absolute gain to the community, balanced only by the cost of improving the road. Supposing that a toll of 5 cents will pay a fair dividend on this, there remain 10 cents per bushel to be divided between the producer and the consumer, enabling the former to sell his wheat at a higher price than before, while at the same time the latter obtains it at a less cost.

Among the most remarkable consequences of the improvement of roads, is the rapidly increasing proportion in which their benefits extend and radiate in every direction, as impartially and benignantly as the similarly-diverging rays of the sun. Around every town or market place we may conceive a number of concentric circles to be drawn, enclosing areas from any part of which certain kinds of produce may be profitably taken to the town, while from any point beyond each circumference, the expense of the carriage of the particular article would exceed its value. Thus the inner circle, at the center of which is the town, may show the limit in every direction from beyond which perishable vegetables, or articles very bulky or heavy in proportion to their value, cannot be profitably brought to market; the next larger circle may show the limit of fruits; and so on. If, now, the roads are improved in any way, so as in any degree to lessen the expense of carriage, the radius of each circle is correspondingly increased, and the area of each is enlarged as the *square* of this ratio of increase. Thus, if the improvement enables a horse to draw twice as much or to travel twice as fast as he did before, each of the limiting circles is expanded outward to twice its former radius, and embraces *four* times its former area. If the rate of improvement be threefold, the increase of area is *nine-fold;* and so on. All the produce, industry and wealth, which by these improvements finds, for the first time, a market, is, as it were, a new creation.

The greater importance to farmers of common roads—the people's highways—than the most perfect railroads, is shown in our next extract.

The distinguishing characteristic of a modern railroad, as compared with a "tram-road," and that to which its peculiar power is chiefly due, is the projecting flanges of the wheels of its carriages, by which they are retained upon the rails. But this peculiarity, in an equal degree,

* In the absence of such an improvement, when the Spanish Government required a supply of grain to be transferred from Old Castile to Madrid, 30,000 horses and mules were necessary for the transportation of 480 tons of wheat. Upon a broken stone road of the best sort, *one-hundredth* of that number could easily have done the work.

lessens its advantages to the agricultural population; since the vehicles which are adapted to travel on a railroad cannot be used on the common roads leading to them, nor in the ordinary labors of the farm; while on all other improved roads the same wagons, horses and men employed at one season in cultivating the ground, can also be profitably employed, in their otherwise idle moments, in conveying the produce to a market. For these reasons, even if a railroad came to every man's door, he could more economically use a good common road; but since, on the contrary, the expense of the construction of railroads must always restrict them to important lines of communication (where, indeed, their value can scarcely be estimated too highly) in every other situation, the greatest good of the greatest number, and the most universal benefits with the fewest accompanying evils will be most effectually secured, by improving (in accordance with the principles to be presently set forth) the people's highways—the common roads of the country.

The great fault in laying out our common roads, according to Prof. Gillespie, is our passion for straightness, to the forgetfulness of every other requisite. He maintains that

*Straightness should always be sacrificed to obtain a level, or to make the road less steep.* This is one of the most important principles of road making, and it is the one most often violated.

A straight road over an uneven and hilly country may, at first view, when merely seen on the map, be pronounced to be a *bad* road; for the straightness must have been obtained either by submitting to steep slopes in ascending the hills and descending into the valleys, or these natural obstacles must have been overcome by incurring a great and unnecessary expense in making deep cuttings and fillings.

A good road should wind around these hills, instead of running over them, and this it may often do without at all increasing its length. For if a hemisphere (such as half a bullet) be placed so as to rest upon its plain base, the halves of great circles which join two opposite points of this base are all equal, whether they pass horizontally or vertically. Or let an egg be laid upon a table, and it will be seen that if a level line be traced upon it from one end to the other, it will be no longer than the line traced between the same points, but passing over the top. Precisely so may the curving road around a hill be often no longer than the straight one over it; for the latter road is straight only with reference to the vertical plane which passes through it, and is curved with reference to a horizontal plane; while the former level road, though curved as to the vertical plane, is straight as to a horizontal one. Both lines thus curve, and we call the latter one straight in preference, only because its vertical curvature is less apparent to our eyes.

The difference in length between a straight road and one which is slightly curved is very small. If a road between two places ten miles apart were made to curve so that the eye could nowhere see farther than a quarter of a mile of it at once, its length would exceed that of a perfectly straight road between the same points by only about one hundred and fifty yards.*

But even if the level and curved road were very much longer than the straight and steep one, it would almost always be better to adopt it; for on it a horse could safely and rapidly draw his full load, while on the other he could carry only part of his load up the hill, and must diminish his speed in descending it. As a general rule, the horizontal length of a road may be advantageously increased, to avoid an ascent, by at least twenty times the perpendicular hight which is to be thus saved: that is, to escape a hill a hundred feet high, it would be proper for the road to make such a circuit as would increase its length two thousand feet.† The mathematical axiom that "a straight line is the shortest distance between two points," is thus seen to be practically untrue in road making, and less appropriate than the paradoxical proverb that "The longest way round is the shortest way home."

The gently-curving road, besides its substantial advantages, is also much more pleasant to the traveler upon it; for he is not fatigued by the tedious prospect of a long straight stretch of road to be traversed, and is met at each curve by a constantly varied view.

It cannot be too strongly impressed upon a road-maker, that straightness is *not* the highest characteristic of a good road. As says Coleridge:

"*Straight* forward goes
The lightning's flash, and *straight* the fearful path
Of the cannon-ball."

But in striking contrast he adds:

"The ROAD the human being travels,
That on which blessing comes and goes, doth follow
The river's course, the valley's playful *windings*,
*Curves* round the cornfield and the hills of vines."‡

The passion for straightness is the great fault in the location of most roads in this country, which too often remind us how

"The King of France, with forty thousand men,
Marched *up a hill*, and then—marched *down again*,"

so generally do they clamber over hills which they could so much more easily have gone around; as if their makers, like Marshal Wade, had "formed the heroic determination of pursuing straight lines, and of defying nature and wheel-carriages both, at one valiant effort of courage and of science."

One reason of this is that the houses of the first settlers were usually placed on hill-tops, (to escape the poisonous miasmata of the undrained swamps, and to detect the approach of the hostile savages,) and that the first roads necessarily ran from house to house. Our error consists in continuing to follow these primitive roads with our great thoroughfares. These original paths were also traversed only by men, and therefore very properly followed the shortest though steepest route. Tracks for pack-horses came next, and a considerable degree of steepness is admissible in them also. Wheeled carriages were finally introduced and brought into use upon the same tracks, though too steep for true economy of labor with them—the standard of slope being very different for foot, horse, and

* Sganzin, p. 89.

† This proportion depends on the degree of friction assumed, a subject to be investigated in a following section.

‡ The Piccolomini, i, 4

carriage roads. Before sufficient attention was paid to the subject, the lands on either side of the road had been fenced off and appropriated by individuals, and thus the random tracks became the legal highways.

The evil is now perpetuated by the unwillingness of farmers to allow a road to run through their farms in a winding line. They attach more importance to the squareness of their fields than to the improvement of the lines of their roads—not being aware how much more labor is wasted by them in traveling over their steep roads than there would be in cultivating an awkward corner of a field."

The evils of ascents and descents having been explained, the question of the advantages of undulating roads is thus disposed of:

UNDULATING ROADS.—There is a popular theory that a gently undulating road is less fatiguing to horses than one which is perfectly level. It is said that the alternations of ascent, descent and levels call into play different muscles, allowing some to rest while the others are exerted, and thus relieving each in turn.

Plausible as this speculation appears at first glance, it will be found on examination to be untrue, both mechanically and physiologically; for, considering it in the former point of view, it is apparent that new ascents are formed which offer resistances not compensated by the descents; and in the latter, we find that it is contradicted by the structure of the horse. The question was submitted by Mr. Stevenson to Dr. John Barclay of Edinburgh, ("no less eminent for his knowledge than successful as a teacher of the science of Comparative Anatomy,") and he made the following reply: "My acquaintance with the muscles by no means enables me to explain how a horse should be more fatigued by traveling on a road uniformly level, than by traveling over a like space upon one that crosses hights and hollows; but it is demonstrably *a false idea* that muscles can alternately rest and come into motion in cases of this kind. . . . Much is to be ascribed to prejudice originating with the man continually in quest of variety, rather than with the horse, who, consulting only his own case, seems quite unconscious of Hogarth's Line of Beauty."

The best width and shape of the road-bed are next examined; the resistance of different surfaces established, and the profits of various improvements investigated. In the directions for "Laying out Roads," are explained methods of performing all the necessary measurements of distances, directions and hights, without the use of any instruments but such as any mechanic can make and any farmer use. The details of construction are very fully given, and copious instructions are laid down for making Macadam roads on their true principles, the favorite Plank roads, &c. &c. A popular exposition of Railroads follows. The concluding Chapter is devoted to the "Management of Town Roads." It points out the great practical evils of the present system of "Road-tax," and suggests an improved system, to which we will return after the publication of the book.

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ESTIMATED CROP OF THE UNITED STATES....[From Reports of Commissioners of Patents.]

| WHEAT. | | CORN. | | RYE. | | BARLEY. | | OATS. | |
|---|---|---|---|---|---|---|---|---|---|
| Years. | Bushels. | Years. | Bushels. | Years. | Bushels. | Years. | Bushels. | Years. | Bushels. |
| 1842... | 102,317,340 | 1842... | 441,829,246 | 1842.... | 22,762,952 | 1842..... | 3,874,622 | 1842... | 150,883,617 |
| 1843... | 100,310,856 | 1843... | 494,618,305 | 1843.... | 24,289,281 | 1843..... | 3,230,721 | 1843... | 145,929,666 |
| 1844... | 95,607,000 | 1844... | 424,953,000 | 1844.... | 26,450,000 | 1844..... | 3,627,000 | 1844... | 172,247,000 |
| 1845... | 106,548,000 | 1845... | 417,899,000 | 1845.... | 27,175,000 | 1845..... | 5,160,600 | 1845... | 163,208,000 |
| 1846... | 117,202,800 | 1846... | 459,666,900 | 1846.... | 59,892,500 | 1846..... | 5,676,600 | 1846... | 172,528,800 |

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EXPORT OF BREAD STUFFS from the United States to Great Britain and Ireland, from September 1, 1846, to March 27, 1847

| PORTS. | FLOUR. | CORN MEAL. | WHEAT. | CORN. | RYE. | OATS. | BARLEY. |
|---|---|---|---|---|---|---|---|
| | Bbls. | Bbls. | Bushels. | Bushels. | Bushels | Bushels. | Bushels. |
| From New-York ..... | 675,146 | 149,861 | 997,718 | 2,939,416 | 2,685 | 124,069 | 130,071 |
| .. Philadelphia..... | 104,937 | 62,581 | 195,439 | 397,914 | | | |
| .. Baltimore ..... | 161,771 | 23,095 | 33,770 | 818,445 | | 20,000 | |
| .. Norfolk..... | 4,581 | 5,149 | | 564,500 | | | |
| .. N. Orleans (to 20th) | 257,890 | | 46,555 | 1,687,459 | | | |
| .. Boston..... | 53,551 | 8,196 | | 463,906 | | | |
| .. Other ports ..... | 1,000 | | 500 | 60,000 | | | |
| Total..... | 1,258,876 | 248,852 | 1,273,882 | 6,931,640 | 2,685 | 144,069 | 130,071 |

The latter Table, though not at all obtained from official sources, is believed to be very nearly correct.

## LETTER VI.

### PROFITS OF SHEEP HUSBANDRY IN THE SOUTHERN STATES—2. AS THE BASIS OF AMELIORATION IN NATURALLY STERILE AND WORN-OUT SOILS.

Feasibility of rendering the naturally sterile and worn-out Soils of the South productive...Means must be ample and cheap...Ordinary Animal Manures from Stables, &c., not attainable in sufficient quantity—too expensive if transported far by land carriage...Animal Manures of Commerce still more out of the question...Gypsum—not sufficient of itself...Wood Ashes—Leached Ashes—their great value, but limited quantity...Lime (marl)...Swamp Mud—inexhaustible quantity of each...Valuable Effects of Lime on Soils...Otherwise when there is a deficiency of Organic Matter...Opinion of Johnston, Brown, Lord Kaimes, Anderson, Morton, Thaër, Petzholdt, Chaptal...Southern Tertiary and Granitic Soils destitute of Organic Matter...Expensiveness of Marl—not very permanent in its effects...The best Swamp Mud worth more per load...This, too, an expensive manure...Both too costly for extensive ameliorations...Is there, then, any resort?—There is—it is to be found in a Mixed System of Green and Animal Manuring, the latter made attainable by Sheep Husbandry...Experience and Testimony of various English Farmers under analogous circumstances... Reasons why Sheep are preferred to Horned Cattle for this purpose...Considered more profitable in England, and by some in the United States, independent of Fleece...Singular Hallucination of Col. Taylor on this subject...Sheep preferred as Improvers of Poor Lands in the Northern and Eastern States, but the end sought by different means from those employed in England...The English System—Reasons why it is inapplicable in the United States...System in the Northern and Eastern American States...Proper System in the Southern States, on Lands now partly Grassed, and on Naked Soils...Green Manuring—how accomplished—Proper Plants for the purpose—Practical Rules—Expensiveness...Should the Pasture Lands of the South be exclusively devoted to Sheep Grazing?—Should not... Home Demand should be supplied by Home Production, in the Staples furnished by all the Domestic Animals—Reasons therefor...As a surplus or exporting Animal Staple, Sheep furnish the one in which the South can best compete with other Producers.

*Dear Sir:* Let us now pass to the second point in reference to which we are to consider the profits of sheep husbandry in the Southern States, viz.: the practicability and comparative economy of making it the basis of an effectual amelioration in soils naturally sterile, or those which have been rendered so by excessive and injudicious cultivation.

The first of these classes of soils is confined, mainly, to the tide-water zone. The second is found both in this and the hilly zone, and, I need not say, in immense quantities.

How can these soils be profitably ameliorated? It is certain that this can only be done by the introduction into them of substances fitted to become the food of plants—or which, by chemical combinations or changes, prepare other substances to become such food. On soils naturally too sterile to sustain useful vegetation, the quantity of fertilizing matter introduced must be comparatively large. Hence it must be cheap, or its cost will more than overbalance its advantages. There are various manures which separately, or in conjunction, would convert the worst acre of barren sand between Richmond and Raleigh, or, if you please, on the Desert of Sahara, into a fertile garden, provided it could have timely rains and be protected from the burying sands. But it is utterly useless to argue the *feasibility* of this means or that, without at the same time examining its *economy*.

The direct and profuse application of animal manures, for example, would probably effectually ameliorate any of these soils. But where are these manures to be obtained, in a region where the first necessary condition for their production, *i. e.* the vegetation necessary to support domestic animals, is wanting? The quantity accumulating in the cities and villages of a comparatively sparsely populated region—in a climate where the preservation of putrefying substances would be incompatible with

health, would be inconsiderable. And whether more or less, it would not pay the cost of transportation to any considerable distance by land carriage. Guano, poudrette, bone-dust, and all the expensive manures of commerce, are still more out of the question. Gypsum, on account of the smallness of the quantity requisite, is a cheap manure, and, reasoning from analogy, should be a valuable one, under proper circumstances, at least on the granitic soils of the South.* Mr. Ruffin states that it produces little effect in the Tertiary sands.† It is considered by practical men to be, at the best, rather an *aider* of organic manure than a *substitute* for it, and when repeatedly applied without any other fertilizing substance, it ceases to produce any visible effect. On an exhausted soil, the chemical constitution of gypsum shows that it could not replace *all* the substances abstracted by the plants; and on one naturally sterile, there is small probability that it would happen to supply the only deficiency necessary to the production of vegetation. Wood ashes constitute a most valuable manure on probably every class of soils, and, unlike lime, gypsum, soda, etc., which afford only a limited number of those substances which constitute the necessary food of plants, they afford in a greater proportion than any other manure the inorganic substances which are taken up and assimilated by plants.‡ They are used with the most beneficial effect on the granitic soils of New-England, the calcareous and aluminous ones of Middle New-York, the silicious ones of the southern or grazing region, and on the Tertiary sands of Long Island. On the latter, of the same geological formation with your tide-water zone—in fact but a continuation of it—even the leached or washed ashes bring a shilling per bushel (the same that is paid for the unwashed ashes by the soaper and manufacturer of pearl or pot ashes) for agricultural purposes.‖ But the supply cannot be made sufficiently large for extensive agricultural ameliorations, without a destruction of the forests, which would inflict a grievous and utterly inexcusable wrong on posterity.

The Southern Atlantic and Gulf States possess two natural and inexhaustible deposits of fertilizing matter, which, it is supposed by many, would be fully adequate to the general "reclamation"§ of their barren and exhausted evils. The first of these is the marl, which underlies large portions of the low country of Virginia and South Carolina, and probably the

* I refer here to the successful example of its use on the granitic soils of New-England. I have particularly specified this class of soils because your *barren* ones are limited to them and to the Tertiary. Gypsum is used at the North on nearly every class of soils with advantage—calcareous, aluminous, silicious and all intermediate varieties. It will be found very valuable, I have no doubt, on your mountain lands, particularly in localities where the clovers flourish.

† Ruffin's Agricultural Survey of South Carolina, 1843.

‡ To show the value of ashes as the food of plants, and at the same time the difference between those made from different woods, I append the following analyses of those of two well-known southern trees. That of oak ashes is by Sprengel, that of pitch-pine ashes by Berthier:

| *Constituents.* | *Oak.* | *Pitch-Pine.* | *Constituents.* | *Oak.* | *Pitch-Pine.* |
|---|---|---|---|---|---|
| Silica | 29·95 | 7·50 | Potash | 16·20 | 14·10 |
| Alumina | 8·14 | 11·10 | Soda | 6·73 | 20·75 |
| Oxide of Iron | | | Sulphuric Acid | 3·36 | 3·45 |
| Oxide of Manganese | | 2·75 | Phosphoric Acid | 1·92 | 0·90 |
| Lime | 17·38 | 13·60 | Chlorine | 2·41 | |
| Magnesia | 1·44 | 4·35 | Carbonic Acid | 15·47 | 17·50 |

‖ This fact I consider an important hint to the planters of the tide-water zone, and it is to be hoped that it is one which will not be thrown away. Leached ashes are valuable also on every other class of lands. The southern portion of my farm (lying on Chemung rocks) is silicious. The northern part is covered with "northern drift," and is therefore calcareous. I use from 3,500 to 4,000 bushels of leached ashes per annum, without any discrimination as regards the soil, and on almost every variety of crops, and invariably with marked advantage. Doct. Emmons, our State Geologist, having in charge the volumes on Agriculture, stated to me that he considered these leached ashes far more valuable by bulk than a rich marl (accessible to me) containing 90 per cent of carbonate of lime.

§ This word ("reclaim") has a provincial signification throughout the North, when applied to land. It means "to render productive." Unlike the words "fertilize," "enrich," etc., it implies *degree*, as well as *manner*. To "reclaim" land, therefore, is to fertilize or enrich it to such a degree that it will yield fair crops. I shall use the word both as a verb and a noun, to avoid the circumlocution otherwise necessary to express this idea.

whole Tertiary formation, or at least that portion of it extending through the Atlantic States. The second is the swamp mud, which, rich with the alluvial deposition of ages, fills nearly every depression of the surface capable of retaining water, in the whole tide-water zone.

Mr. Ruffin recommends the former as the best and most attainable fertilizer on both of the classes of soils under examination. He seems to think it adequate, of itself, to their full and permanent amelioration. I do not desire a word which I shall say to bear, or even seem to bear, a controversial tone toward the views of this ardent and enlightened friend of Southern Agriculture. In expressing my dissent from them, my limits and the occasion only permit me to allude to a few well-settled principles and facts on which I have based my opinions. Lime acts mechanically and chemically on soils. It stiffens loose and opens clayey ones. It is, to a certain extent, one of the necessary constituents of plants; it neutralizes acid substances in the soil; it forms compounds, and promotes the dissolution of existing ones, to prepare suitable food for plants; and sometimes produces certain other minor beneficial effects. But its great, its chief object, is to produce the food of plants by its chemical action on the *organic matter in the soil.* Hence, says Johnston:

"Lime has little or no effect upon soils in which organic matter is deficient;" and he farther says: "Under the influence of lime the organic matter disappears more rapidly than it otherwise would do, and that after it has thus disappeared, fresh additions of lime produce no farther good effect; . . . it causes the organic matter itself ultimately to disappear."

"It is scarcely practicable," says Brown, 'to restore fertility to land even of the best natural quality, which has been thus abused; and thin moorish soils, after being exhausted by lime, are not to be restored."

"An overdose of shell marl," says Lord Kaimes, "laid perhaps an inch thick, produces for a time large crops, but at last renders the soil capable of bearing neither corn (grain) nor grass, of which there are many examples in Scotland." "The same," continues Johnston, "is true of lime in any form. The increased fertility continues as long as there remains an adequate supply of organic (animal and vegetable) matter in the soil; but as that disappears, the crops every year diminish both in quantity and in quality."

"On poor arable lands, which are not naturally so, but which are worn out or exhausted by repeated liming and cropping, lime produces no good whatever." (Anderson, Brown, Morton.)*

Let us now turn to the opinions of some of the most eminent European Continental writers. The celebrated Thaër in his "Principles of Agriculture" (Section IV. Part I.) says:

"On no soils are the effects of lime so beneficial as on those which contain a great quantity of sour humus prejudicial to vegetation, or on those which have been supplied more or less abundantly with animal manure for a considerable period, without receiving an application of lime, or some other substance of a similar nature. In the latter case it is frequently much more efficacious than an amelioration of stable manure would be; but it soon impoverishes the soil so much that in a few years it becomes indispensably necessary to manure it abundantly with rich animal or vegetable matters. As some portion of the humus, although in all probability of an insoluble nature, always remains in arable land even when it appears to be much exhausted, it of course follows that an application of lime will always be productive of very marked effects even on the poorest soils, because it will call into action all the nutritive particles which they contain. A second amendment of a similar nature bestowed shortly after the first, will be productive of some, although in general of much less benefit; and the effect of each subsequent amelioration of this nature will be progressively diminished unless the soil receives an additional supply of humus. . . . The effect produced by lime on land of this nature (reclaimed bogs and marshes) is much more beneficial and durable than that of any other manure. On the other hand, repeated ameliorations of lime will soon totally exhaust and impoverish poor and sandy soils, and reduce them to absolute sterility, even though each separate application seems to be productive of some good effect. . . . Many persons who have not rightly comprehended the cause of the effects produced by lime, prefer it to manure, and have believed in the possibility of doing entirely without the latter; but the total exhaustion of the soil which such a course of proceeding must sooner or later produce, caused them to fly to the opposite extreme. . . . An en-

* See Johnston's Agricultural Chemistry, vol. ii. p. 139–142.

lightened and scientific agriculturist will soon perceive that the use of lime can never supersede that of dung, but that it renders this kind of manure more energetic in its action. . . .

In many places where its ameliorating effects were known and appreciated, many agriculturists have calculated that marl would prove a cheaper manure than stable dung; and have, consequently, determined to do without the latter altogether; and, therefore, have diminished their stock of cattle, and sold their hay and straw. It may easily be imagined that as soon as the chemical effects of the marl ceased to operate, as must be the case when the land no longer contained undecomposed or insoluble substances, the soil became sterile, and a second marling was incapable of producing any beneficial effects, there being no humus for it to act upon."

Petzholdt, in his "Lectures to Farmers on Agricultural Chemistry," (Lecture XVII.) says:

"Quick-lime greatly accelerates the decomposition of humus, whether of animal or vegetable origin, inducing a more speedy liberation of its salts than would otherwise take place. This is the reason quick-lime has proved so advantageous in the cultivation of bogs; the lime not only accelerates the decomposition of the humus, but it may be said altogether to be the cause of the decay of humus, which, as it exists in peat, is scarcely by itself undergoing the process at all. . . . Where there is neither humus in the soil, nor undecomposed silicates, the application of lime as manure will be useless. . . . So much, however, is deducible from all experience, that the mere application of marl to an exhausted soil is of no use whatever, unless it is carried on the field in such quantities as to constitute a new soil, covering the whole surface to the depth of a foot. . . . In a chemical point of view, marl is not of any value except where the soil requires a supply of lime. . . The other mineral constituents of marl are far too inconsiderable in amount to be reckoned upon."

Chaptal, in his "Chemistry applied to Agriculture," (Chap. iii., Art. 2,) thus expresses himself:

"It is acknowledged that lime is principally useful upon fallow lands which are broken up; upon grass lands, whether natural or artificial, which are prepared for cultivation: and upon muddy lands, which are to be put into a fit state for culture. It is well known that in all these cases there exists in the land a greater or less quantity of roots, which, by the application of lime, may be made to serve more immediately for manure, by the solubility it will give to the new products formed by them. . . . Independently of this effect, which, in my opinion, is the most important, lime exercises other powers, which make it a very valuable agent in Agriculture."

These authorities might be multiplied *ad infinitum*.

On the alternately too loose or too hard soils of the dry and barren lands of the tide-water zone, lime would doubtless have two salutary effects—the mechanical one already noticed, and it would furnish *one* necessary food of plants. But of its power to render these soils, or the exhausted ones of the middle zone, anything more than transiently fertile, there is no probability, if they are, as I suppose them to be, generally rather, and sometimes very, destitute of organic matter. This destitution I infer from ocular examination;* also from the fact that they are covered with little vegetation, with the exception of the long-leaf pine, to produce by its annual decay a store of organic matter; and, finally, if this organic matter existed in these soils in any considerable quantity, *they would not be sterile*. They probably possess the ordinary inorganic constituents of dry Tertiary and granitic soils, and no properties directly deleterious to vegetation. Organic matter, then, in my judgment, is what they principally stand in need of to render them fertile. Now, by applying lime to them, it would undoubtedly do good in two ways, as before admitted; but the considerable temporary apparent amelioration, as evinced in some instances by the increased growth of vegetation, is factitious, for the lime is only acting with and exhausting the little organic matter in the soil, to leave it to greater eventual sterility. Hence the saying that "lime enriches the father but impoverishes the son," is a true one when the lime is applied to soils possessing but a small proportion of organic matter. On such, lime soon

* I have seen no analyses of these soils, and mean therefore as I say, simply, examination by the eye.

leads to exhaustion, unless *organic matter is added to the soil in proportion to the waste.* The theoretical and practical considerations which should govern in the application of this fertilizer to soils are discussed more fully and, in my judgment, more ably by Johnston, in his Agricultural Chemistry, than by any other writer. To him I take the liberty to refer you.

Marl raised from pits, as it must necessarily be (except when denuded, or cut through, on the beds of streams, &c.) where it occurs only as an under-stratum in a flat country—where the pits, too, often require machinery, or much manual labor, to keep them free from water while working—must be an expensive manure. From its tendency to sink in the soil it is not so permanent a one as would naturally be expected. On reclaimed swamp lands—as, for example, on the rice lands—abounding in vegetable matter, it will be found a most efficacious manure, and, *when needed*, will repay the necessary outlay; but I fear it will be found otherwise ultimately, if not immediately, on the barren sands and exhausted granite soils of the South. Applied *with* swamp mud, it would constitute a fertilizer scarcely, perhaps, admitting of a superior, even on the latter soils. In their *single effects*, however, I cannot but believe that the best swamp mud —that which is black and fetid by the long continued accumulation of organic substances (and especially if charged with shells, and the shields of Infusoria)—would be worth more per load than the richest marl. The mud, too, should be considerably cheaper than the marl, no deep excavations being required to obtain it.* Digging and draught, and, in the case of the mud, draught alone, would render both decidedly expensive manures, relatively to the value of the land after being ameliorated by them, even assuming that amelioration to be complete and permanent. On lands immediately contiguous to conveniently reached depositions of mud or marl, on a scale so limited that it could be carried on at spare intervals without encroaching on the regular routine of plantation labor, it might be good economy to haul out mud and marl, and thus gradually reclaim small pieces of land.† It certainly would be better economy than to waste those intervals in idleness. But in anything like an extended and speedy system of reclamation—the fertilization of thirty, forty or fifty acres per annum, instead of one, two or three—the means above adverted to are, in my humble judgment, utterly out of the question. The labor would absorb all the labor of man and beast on the plantation; and it is exceedingly questionable, in my mind, whether the land, when fertilized, would sell for the cost of the manure.

Hard would it be for many a South Carolinian or Virginian to turn his back on the *Lares* and *Penates* of his race—forgetting many a proud local and ancestral association—but as a question of dollars and cents, sometimes a necessary one, and, at all events, usually the paramount one, I think it past a reasonable doubt that it would be better economy to desert the worn-out or naturally barren soils of our South-eastern coast, and purchase the virgin and fertile lands of the South-west (even including the extra expense of building and fencing), than to attempt to reclaim the former by means so expensive as those above indicated.

What, then, is the resort? Are there *any* means by which those lands can be *profitably* reclaimed? I answer, Yes; and the resort is a mixed system of green and animal manuring—the latter made attainable by sheep husbandry. Experience is the best test of all theories. And we have had

* I am inclined to think, however, that this mud, if spread directly on the surface, would contaminate the atmosphere with unhealthy miasma, generating agues and bilious diseases. If so, it would require incorporation with the soil, by plowing.

† It seems to me, however, that these expensive manures would be more profitably applied in *keeping up* the fertility of the *best* lands, or as *assistants* to other and cheaper means of reclaiming the poor ones.

so little experience in the premises, in our own country, let us turn to that of the first agricultural nation of the Old World. There is no foreign nation where so high a degree of intelligence is brought to bear on farming operations—where cause and effect are so carefully studied and accurately noted—as in England. This care and accuracy are indispensably necessary in a country where high rent and heavy taxation render good farming or bankruptcy unavoidable counter-alternations to the agriculturist. Prevailing conclusions among such a class of agriculturists—*undisputed* conclusions, too—are assuredly entitled to great respect, and may almost be regarded as settled facts. Now the farmers of England are perfectly familiar with every kind of manure accessible to our Southern farmers, unless it be swamp mud and cotton seed. Lime, for example, is plentiful and cheap, and is much used in Agriculture all over the kingdom. If either this, or any of the manures of commerce, were considered, of themselves, economical fertilizers of the poor, sandy or light upland soils of England, there is no country in the world where they are more plentiful, and, when the use of the soil and the price of products are taken into consideration, more cheap.

What the settled conclusions of the English farmers are, in relation to the profitable amelioration of those soils, will be seen from the following undisputed testimony of some of the most eminent and respectable of them, taken before the Committee of the House of Lords, charged with the inquiry into the state of the wool trade, &c. in Great Britain, in 1828, from which I have so freely quoted in preceding Letters.

Mr. WILLIAM PINKNEY, *Salisbury Plain:* Land such as I occupy could not be maintained without the aid of sheep. . . . The sheep are our principal dependence for supporting our crops; indeed, I could not occupy my farm without my flock.

Mr. JOHN ELLMAN, Jr., *Sussex:* I do not consider it possible for the light lands upon the Downs to be kept in cultivation without flocks. I could not keep the farm I now hold without sheep. . . . On the South Downs the wool must be grown, let the price be what it will.

Mr. FRANCIS HALE, *Alringham, Suffolk:* The description of land I occupy could not be kept in cultivation without the aid of sheep.

Mr. HENRY KING, *Chilmark, Wiltshire:* The size of my farm is about 4,000 acres. I clip annually about 6,500 South-Down sheep. . . . Such lands as I occupy cannot be kept in cultivation without the aid of sheep.

Mr. JOHN WOOLLEDGE, *near Bury St. Edmunds, Suffolk:* An estate near the above place contains 8,890 acres, let to tenants, and consists principally of poor sandy and gravelly land, the produce of which in grain is very precarious, amounting in dry summers to little or nothing. The occupiers, therefore, depend almost entirely on their flocks of sheep for the payment of their rents and the employment and support of the population. . . . I am of opinion that two-thirds of the counties of Suffolk and Norfolk may be comprehended in the sheep districts, and that they produce two pounds and a half of wool, and three-fourths of a lamb, to the acre, upon an average. . . . The produce of the land depends materially upon the folding system; there is not sufficient straw for manure without the assistance of sheep.

Mr. WILLIAM ILOTT, *Abbey Milton, Dorsetshire:* I calculate the annual growth of wool in Dorsetshire at 10,000 packs of 246 lbs. each. It is estimated . . . that 800,000 sheep, or one sheep and one-seventh per acre, . . . are kept in this county. A considerable part of the county of Dorset is composed of light lands, and can only be kept in tillage by the aid of sheep.

C. C. WESTERN, Esq.: It is utterly impossible that the Down Districts can be cultivated to advantage without sheep. We never fold our Merino or other sheep; the land is too wet.

LORD NAPIER: If we had not sheep upon our lands (the highlands of Scotland), it would become the habitation of foxes and snipes, and return to waste; it would produce nothing but grouse and wild game of different sorts.

Is it asked, Why are sheep preferred to horned cattle? Many of the reasons are given in my preceding Letter. Then, again, the scanty and short pasturage of light lands, on which sheep will thrive, will not afford sufficient "bite" (as it is provincially termed in the Northern States) to

profitably carry large stock. And, finally, there seems to be a settled conviction among the English farmers that sheep give a better return for the food consumed, and therefore better repay the extraordinary expenditure necessary to bring poor lands in a fit state for the plow, than any other animal. In an able essay in the London "Plough" (June, 1846), the following remarks occur, which may be probably regarded as an expression of the prevailing opinion in England:

"It is justly admitted that, of all the domestic animals reared and fed for profit in Great Britain, sheep are of the greatest consequence, both individually and in a national point of view, and afford a better return than can be obtained either from the rearing or feeding of cattle; the very fleece shorn annually from their backs is worthy of consideration. . . . Sheep husbandry deserves to be esteemed in all its different branches, and claims the priority of consideration among agriculturists."*

The manner in which the "very fleece" is here spoken of, shows that wool occupies but a mere subsidiary place in making up the profits of English sheep husbandry. I know many intelligent and experienced farmers in *this country* who think sheep feeding more profitable, or equally profitable, with cattle feeding, leaving the wool out of the account.†

The experience of the English farmers accords with that of those of our own Northern and Eastern States, in relation to the superior advantages of sheep husbandry on poor and light soils. Observation has shown both that such soils do not profitably carry bullocks or other large animals, and that such animals are poorer manurers than sheep. But their methods of availing themselves of the advantages of this husbandry are entirely dissimilar. The English farmer finds mutton and grain the marketable products which pay best. The first returns a profit on the crop (turnips) which produces it, and at the same time fits the land for the latter. The high price and ready sale of mutton allows the English farmer to force the growth of turnips on poor soils, by the application of highly condensed manures.‡ In the fall the sheep are turned upon small patches of them, surrounded by an inclosure of hurdles. The turnips are drawn, sliced, and laid in troughs for the sheep. When one patch is consumed, the hurdles are removed, and thus the field is gradually passed over—the sheep converting the whole crop into animal products and manure. The land is then plowed for grain, and a succession of crops are taken from it. By this means the land is soon reduced to its former level, and the same system is again entered upon.

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* After reading this and the preceding testimony, one cannot look back without a smile on the unaccountable monomania of that excellent man and public benefactor, Col. John Taylor, in relation to sheep. In one of the essays of "Arator," he says:

"My conclusions are that they require and consume far more food, in proportion to their size, than any other stock; that they are more liable to disease and death; and that they cannot be made a profitable object throughout the whole extent of the warm, dry climate and sandy soil of the United States, but by banishing tillage from vast tracts of country." . . . "It is probable that the hot constitution of sheep produces a rapid digestion, and that insatiable appetite, by which the fact is accounted for of their flourishing only, to any extent, in fine meadows or extensive wildernesses. If this voraciousness is not gratified, the animal perishes or dwindles; if it is, he depopulates the country he inhabits. The sheep of Spain have kept out of existence, or sent out of it, more people than the wild beasts of the earth have destroyed from the creation; and those of England may have caused a greater depopulation than all her extravagant wars. It may be owing to this animal, the independence of one country is almost overthrown, and of the other tottering." (!!!) He farther expresses the opinion that England, "by the help of her moisture and verdure, can raise wool cheaper than the United States." (!)

It would appear that Col. Taylor formed all his conclusions on a small flock kept by himself. They may have been a bad and unthrifty flock. But it is strongly probable that he was influenced by deep-rooted prejudices, imbibed before his judgment was ripened, or his experience formed; and that these, unknown to himself, warped all his views. I can account in no other way for the evident and palpable hallucination under which he made nearly every statement in his Chapter on Sheep.

† A gentleman who has been one of the most successful feeders of cattle and sheep in this State (P. N. Rust, Esq. of Syracuse) recently remarked to me in conversation that he had invariably found that sheep paid better for feeding than cattle.

‡ Bone-dust, and frequently guano or some other manure with it, is *drilled in* with the turnip seed, so that much cost is obviated by making a little go a great ways; and there is a remarkable congeniality in the climate and atmosphere of England to the growth of this root.

In the United States, much of this system would be inapplicable and unprofitable. Here wool, instead of mutton, is the principal object. Even in the Southern States, where the climate would render the English system practicable, the expense of producing either of these articles, by winter turnip feeding and folding, would add so much to its cost that it could not profitably compete with that grown in the ordinary manner. The same remark applies to the relative expense of the two systems of manuring. A constant repletion of rich succulent food, like turnips, would sensibly increase the amount of manure, and, by folding, it would be more evenly distributed. But neither of these considerations would begin to offset against the increased expense, in a country where good lands are so cheap and bread-stuffs so low. Besides, no good, but, on the other hand, positive injury, would result from thus annually *fattening* "store"* sheep, kept for the production of wool and for breeding.†

The system of improving poor lands in the Northern and Eastern States by sheep husbandry, is mainly by summer pasturage. The droppings of the sheep gradually enrich them,‡ and consequently increase their herbage. Thus, in a few years, poor and scanty pastures are converted into rich, productive ones. This might be far more rapidly done by giving these pastures also the winter manure of the sheep, made in the feeding yards. But it is generally thought more profitable to give the winter manure to the richer tillage lands, which are made to supply the grain and hay of the farm. The light pasture lands are thus kept permanently in pasture, or are only plowed, by the provident, at very long intervals. This system is rendered necessary, or, at all events, convenient, by the topographical features of our farms. Here the poorer and lighter are generally the higher and more broken lands, which are less convenient of aration, and for the hauling on of manure, or the hauling off of crops.

In the Southern States, on lands which now yield even a smallish supply of esculent grasses, the northern system is all that is *necessarily* required. Those grasses will every year increase, and the land will be gradually fertilized, by the droppings of the sheep, without a cent's expenditure on it of any kind; and every particle of herbage will be turned to its most profitable account, by being converted into wool, mutton and manure.

But where there is not sufficient existing verdure to form the germ, so to speak, of a future good pasture—or, in other words, to support a sufficient number of sheep to convert it, within a reasonable time, into good pasturage—some other course must be adopted. Proper plowing and seeding, simply, will, I have not a doubt, be found adequate in a great many instances where it would hardly be suspected. It is very natural to take it for granted that a soil, not spontaneously producing the grasses, is not fertile enough to produce them, even if properly sown upon it. But experience has amply demonstrated the contrary in several of the Northwestern States. There are various causes, besides a want of fertility, which may produce such nudity; but this is not the place to enter upon speculations on this topic. Two very common and obvious causes are too great looseness or compactness of the surface, which prevents seeds from taking root, especially in a dry, hot climate. Plowing would always loosen

* This convenient word is provincially applied, in the Northern and Eastern States, to sheep and swine which are to be kept over the year, to breed from (and the former to produce wool), as contradistinguished from those which are fattening for slaughter.

† This point will again be adverted to. It is sufficient now to say that breeding-ewes, if brought to a high state of fatness, raise fewer lambs. The lambs are born weak, and are very apt to perish. There are also other objections.

‡ Aided by an occasional top-dressing with gypsum.

hard, and frequently stiffen loose surfaces.* The grass seed harrowed into a properly prepared soil, at the suitable season of the year, might so root itself as to withstand the subsequent heats, while those dropped on a hard or a loose surface by birds, or borne there by winds, would be exposed directly to the rays of the sun, which, if it did not entirely prevent germination, would dry up and kill the tender roots before they could strike deep enough to resist its influence. Much will depend, in this experiment, upon a proper selection of the variety of grass sown. That variety should be sown which is found to flourish best on similar soils, in the same climate, even though relatively it may be an inferior grass.†

By means as cheap and attainable as these, I have not a doubt that no inconsiderable portions of the nearly naked soils of the tide-water zone might be brought into pasture sufficiently good to make their ultimate conversion into prime pastures, by means of sheep husbandry, certain.

On the worn-out granite soils of the middle region, the once fertile red clay lands—now occupied only by dwarf pines, worthless broom-grass, etc.—*deep* plowing and thorough sowing (with the aid of steeps and the cheap top-dressing, before adverted to) would *generally*, I believe, bring these lands into pretty good pasture. These soils, having been subjected only to the one-horse plow, and hand tillage, *are worn out only on the surface.* This is proved, in innumerable instances, in Fairfax, and other northern counties of Virginia. Lands considered entirely worn out, and sold for a mere trifle, are subjected to the northern two-horse plow, and from one to three inches of earth, *never before disturbed*, is brought to the surface, which readily supports grass, and even grain crops—the latter temporarily. Thus, most fortunately, the means are still left, with the aid of pasturage, to make many of these lands profitably productive, and to restore them to much of their former fertility.

We come now to another class of lands which may, in many cases, be worth reclaiming, but which will not, by merely being plowed and sown, produce sufficient grass to make their fertilization by sheep husbandry attainable—or attainable within a moderate period of time. These are the inferior (but not the worst) sands of the tide-water zone. Here green manuring must be resorted to, by means of plants which will better withstand the climatic and other difficulties in the way of their getting well-rooted, and which will flourish in poorer soils than the grasses. Both of these conditions are answered by various plants. Spurry *(Spergula arvensis)* and white Lupins *(Lupinus albus)* will flourish on dry, barren, and even shifting sands, and are extensively used as green manuring crops on such soils, on the Continent of Europe. From their rapid growth and extraordinary productiveness, they are admirably adapted to this end. The introduction of these plants would probably supply an important desideratum in Southern Agriculture, unless, as I have already expressed the opinion,‡ the pea leaves little to wish for, as a green manuring crop on every class of southern soils. Soaked in a solution of nitre—rolled in lime—top-dressed, after sprouting, with a slight sprinkling of ashes and gypsum‖—

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* The sands of the tide-water zone are everywhere, at greater or less depths, underlaid by clay. These might in some cases be reached by the plow, and portions of them incorporated with the superincumbent soil

† See Letter III. ‡ In Letter III.

‖ Sprengel's analysis, in Letter III., shows the large amount of potash required for the seed, and of lime for the straw of the pea. The favorable effect of plaster on this, as on most other leguminosæ, is well known. Ashes, plaster and lime can be purchased here at an average of less than ten cents a bushel. A bushel of gypsum, mixed with say two bushels of ashes, makes a top-dressing which will pay for itself a number of times over, on any land to which I have ever seen it applied. In addition to rolling the seed in lime, a few bushels of it, or of marl, would make a good, and, where accessible and cheap, an economical top-dressing. When I speak of the price of lime here, I do not refer to marl. The latter, in its natural state, could be purchased at the beds for probably a shilling a load.

the pea would probably take root and flourish in any soil which the price of land in this country would justify an effort to render productive, now, or for a long term of years to come. Indeed, the capacity to produce this plant *may* afford the best practical test of the economy and expediency of attempting it in any given case. If a good green manuring crop can be made to grow on the soil without any more expensive aids than those above suggested, the *lever* of improvement—cheap, but effectual—is placed in the hands of the planter, and, if he possesses the least degree of energy, he has no occasion to seek a new soil and home by emigration.

Mr. Ruffin states, if I remember aright, that a few *quarts* per acre, of peas, are sown by the Southern planters. In the North, three *bushels*, at least, are sown; and this quantity would be little enough to produce the largest amount of green manure.

Theory would indicate that the crop should be turned under before it comes into full flower,* but experience and convenience both deserve consulting in the premises.

An active span of horses, with a Northern two-horse plow, and an expert plowman, would readily plow two acres per diem, on sandy soils, and plow it well.† The expense of getting in a crop of peas can then be readily estimated.

If one crop can be made to take root and grow, and is plowed under *when green*, the great point is attained, and there will be neither difficulty nor uncertainty subsequently. The organic matter thus deposited in the soil is the *basis* on which future improvements can be effected *ad libitum*. As far south as South Carolina, at least two, and probably three crops could be plowed in during a single season. This might be done in time for winter grain, and a crop of the latter sown as a covering crop with grass seeds. The grain would refund much of the previous expense.

Plowing in two or three crops in succession may, at first view, seem an expensive process; but, with the exception of the extra seeding, it is no more labor than is bestowed on *every* wheat crop by a large proportion of the farmers of Western New-York! When the ground is summer fallowed, the ordinary practice on our wheat lands is to have it three times thoroughly plowed and harrowed, and the first time a crop of clover is plowed in. All this is a light outlay compared with thorough marling, or manuring with swamp mud. And, after either of the latter processes, the land has yet to be plowed and seeded.‡

It would not be *necessary* to plow in as many as *three* crops of peas, to lay the foundation of ordinary pasture. Two, and possibly one, would suffice. The comparative utility of forcing forward the fertilization of land, rapidly or gradually, depends much upon the amount of capital which the landholder has to devote to this object. The amount of labor subtracted from the ordinary operations of the plantation would be very small, in any case, in proportion to the object to be attained. A single expert plowman, with a good team, could give even the three plowings to a large field.‖

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* "Because flower-leaves," says Johnston, "give off nitrogen into the air; and, as this element is supposed especially to promote the growth of plants, it is desirable to retain as much of it in the plant and soil as possible."—Ag. Chem., vol. ii., p. 185.

† Perhaps more. That amount is frequently exceeded here, on stubble lands.

‡ So that the expense to be offsetted against one of those processes (in estimating their comparative economy as a means of reclamation with green manuring) is plowing, harrowing, and seeding *twice*.

‖ I have attempted to fix no definite data on this point, because you, who are acquainted with plowing Southern lands, are better competent to do so. I would remark, in this connection, that my convictions are very strong that the introduction of the two-horse plow of the North would lead to a decided improvement in your Agriculture, from the superior manner in which it does its work, and by leading to deeper plowing. The wheel will cause it to run as shallow as a one-horse plow, however, where the character of the soil renders it desirable.

Even in the case of either of the two classes of soils before treated of (those now producing thinnish pasturage, or which can be converted into pastures simply by plowing and seeding), one or more green manuring crops would form a most excellent and accelerating initiatory step, and, where sufficient capital is possessed, I have no doubt, a most economical one, toward their fertilization.

In view of all my preceding statements, do you ask me if I advocate sheep husbandry exclusively, on all the lands at the South which already are, or should be devoted to grazing? Most assuredly not. I have already laid it down as a maxim that "agricultural production should be controlled by the demand or want, and the adaptation of the country to such production." By this rule, the South should, at least, never import a horse,* a mule, a pound of beef, pork, butter, cheese or wool. She *wants* them all, and she can *produce* them all more economically than she can import them. That declared impossibility in politics, an *imperium in imperio*, should be in Agriculture, so far as it may be consistently with the above maxim, the attitude of every farm and plantation. Each should be *independent* to the greatest economical extent, so far as the production of the necessaries, comforts and luxuries of life are concerned, of every other farm or plantation in the *world!* This mixed and multifarious farming is objected to by theorists, inasmuch as it trenches on the division of labor principle. But it favors rotation, and thereby prevents the exhaustion of soils—leads to a more bountiful use of the every-day comforts of life†—and, finally, it is less hazardous. The one-crop farmer, if crop and market are both in their most favorable state, realizes great profits. But if the market is poor, or the crop small, the loss is proportionately large. The farmer pursuing mixed husbandry will not generally fall greatly behind the *best* profits of the other, and his losses are rarely considerable. It is better to play for a *hit* than a *gammon*, where, as in the case of the small capitalist, affluence or penury "stand the hazard of the die!"

If the above positions are true, the South is called upon to increase the breeding of other domestic animals as well as sheep. To an extent sufficient to *supply her own wants*, I consider her imperiously called upon so to do. I advocate the breeding of sheep specially—on a vastly more extended scale—because, as has been already shown, they are the best (if not the only) reclaimers of your unproductive lands; and because in that surplus of the products of grazing, which these extensive reclamations will bring about, *they furnish you the exporting‡ article (wool) for which you can find the largest extra-limital market, and in growing which you can best compete with other producers.*

Let us suppose, for the sake of the argument, that these newly reclaimed pasture lands would carry heavy beasts as well as sheep, and with equal benefit to the land. After supplying the home demand, what would be done with the surplus horses, mules and beeves? To what markets in the world could you export horses and mules, with the exception of some of the West India islands—the markets of which a few thousand head of these animals would annually glut? Do you ask me what would prevent your sending your surplus beef to England? Nothing. But neither the South, nor the North, nor the East, can compete with the great North-west

* Unless for the improvement of breeds.

† I mean by this that the planter who raises all the necessaries of life will be more liberal of them than the one who *purchases* them.

‡ I do not use the word here in its technical sense. I mean carried beyond mere local limits for sale—whether that sale be effected in the same State, in some other part of the U. S., or abroad.

‖ I have not alluded to the rearing of swine any more fully, as they are but partially a grazing animal.—But if the position assumed in the text is correct, it is another argument in favor of devoting your lands to the production of *surplus* wool, instead of *surplus* corn.

in producing beef (or pork||) for exportation to foreign countries. Its immense natural pastures—the profusion and cheapness with which Indian corn can be produced on its virgin soils—give it an advantage which increased transportation by no means counterbalances. The question then arises—Why, for the same reasons, cannot the vast North-western plains produce wool more cheaply than the South, and undersell her in our own and the foreign markets? In the first place, the western pastures—that is to say, the wild or natural ones—which produce beef so cheaply, are, by reason of the coarseness and rankness of their verdure, *not* adapted to *the growing of sheep.* Secondly, the shortness and mildness of the southern winter give a decided advantage in wool growing, by affording green winter feed—an advantage not profitably available probably, on an extended scale, with large grass-feeding animals. Again, in the North-west, though there is less snow, the winter is about as long, for all the practical purposes of husbandry, as in New-York.* Killing frosts come as early in autumn; the naked ground is frozen as solidly, and far more deeply; and verdure puts forth but little if any earlier in the spring. The South then possesses the same great advantage with the North-west in the production of wool—*cheap lands;* and, superadded to this, she has the short, mild winters, which give her a decided advantage over both the North and North-west. She has a marked advantage over the Northern and Eastern States in *both particulars,* and, instead of importing manufactured wools from them, she ought to supply them, by export, with at least the raw material. And she will do this at no distant day, unless her sons are content, in the great struggle and battle of industrial interests, to sacrifice their own by apathy or irresolution.

* The winter feeding of sheep in New-York has already been stated to average about one hundred and fifty days.

## NEW-ENGLAND ECONOMY OF MANURES.

It is well known that in all New-England, to have a *supply of peat at hand* is considered a very valuable appendage to a farm. There they say one-third stable manure and two-thirds peat well combined, is equal to the same quantity of stable manure. Why is it that the same material is, in the Middle and Southern States, so little valued, comparatively? Is it from an essential difference in the quality of what is called peat in the two localities? or in the no less essential difference in the habits of the people?—the one poking their noses here and there and everywhere in search of everything that can be converted to manure, just as they would look for money, if they were as sure of finding it, while the others overlook a thousand things that are just as much worthy of being gathered up and saved, as would be the money that only represents their value? We would ask any one who reads the following paper, (whether he concur in all, or differ with the writer as to some of his positions,) if anything short of absolute mental blindness can justify farmers in not rising up in a body and demanding the establishment of institutions for *preparing men* to give instruction, all over the country, *in the principles of Agriculture,* and in seeing that such instructors, being well qualified, be also *well paid and duly honored,* and placed at least on an equal footing with professors of the military or any other art? For, after all, is not Agriculture a complicated manufacture, requiring great art in the combination and use of the materials to be employed? What will a bushel of wheat do, itself, toward reproduction? Or were it in the hands of a man, were it possible to suppose a man, who knew absolutely *nothing* about cultivation? Clear it is that not only could he make nothing of the wheat itself, but neither

could he with it, and any one of the elements or means employed for reproduction. He would soon find that it would be of no avail to combine it with earth without moisture—nor with earth and moisture without heat—nor with these without air—nor with all these without light! Nay, even with the aid of earth, air, and moisture, and light, he would find other elements indispensable: he must have in all these certain kinds of food, adapted to *its particular nature*, to be consumed and digested by that particular crop. And then, again, to till, to reap, to gather, to thresh, with a profitable economy, and not to have its produce cost, like the Indian's gun, more than it comes to, he must have implements of various kinds, and these, again, must be constructed on certain principles of mechanical philosophy, to make them most efficient and available, and is any man bold enough or blind enough to contend that it does not require education, thought, acquirement, to ascertain whether and in what proportion these elements of subsistence be present, and in what quantity? Whether these implements are constructed on true principles and the animals employed of true form and constitution? Why, then, will not the Press of the country give its aid in bringing about this great consummation? Let us not be told that the public mind is not prepared for it. It is exactly in the right condition to receive the proper impulse: *it has begun to feel it.* There must be a beginning to all great moral movements. The time was when our British ancestors went naked, or wore deer-skin breech-cloths. From that age to the present the world has been meliorating, with occasional Providential or barbarous checks, such as pestilence and *war;* but the average movement has been glorious for the cause of humanity, civilization and the arts. The next great step is to be *suitable education for the agricultural class;* and we trust there is no harm in saying, *may God speed it!*

*P. S.* Let the reader note the *locale* of the following:

For The Farmers' Library.

## MANURING PEAT LANDS.

Dutchess Co. (N. Y.) Agricultural Institute, Feb. 22, 1847.

The question often arises in the minds of the agriculturist, *Why do Peat Soils require an application of manure?* Experiment has almost invariably proved that if yard or mineral manures are copiously incorporated with peat soils, the favor is as promptly reciprocated as when they have been employed upon a diluvium or alluvial soil.

Individuals of practical information only reason upon the subject something after this wise: that the substance composing peat beds once possessed vitality, and that all the essential elements for maintaining life and growth were present; consequently these essentials must still abound in the semi-decayed body, and why should these soils require additional organized matter in the form of yard manure to induce a good degree of productiveness? We conceive that there may be three reasons why productiveness is vastly augmented upon those lands by applying manures: firstly, an excess of deleterious acids; secondly, want of appropriate inorganic nutriment; thirdly, want of one essential organic element.

First, that there is excess of deleterious acids which retard the growth of cultivated crops.

This proposition will be readily conceded, when we inquire from what class or classes of plants peat has originated. The first impulse given to a peat production is the transportation of organic fragments by water to horizontal or slightly inclined grounds, which produce a marsh.

Mosses, lichens and reeds take root upon this marsh, flourish through the summer, but are stricken down by autumnal frosts, and are succeeded by a more luxuriant growth the following season. Thus the destruction and reproduction of these annuals are perpetuated, each season's product becoming nutriment for their successors.

In a few years there is such an immense accumulation of organized matter, from perishing cryptogamous plants, and from the accessions made by water, that plants containing more woody tissue begin to thrive, such as the brake and fern. These disappear after a time, and are succeeded by marsh grasses (*Carexes*) and stinted lowland shrubs; these, again, are followed by larger shrubs and trees.

Lastly, when the bed has become deep, some drier and more perfectly decom-

posed, there emanate the sturdy oak, the saccharine maple and the majestic elm, the richest and most immense spontaneous vegetable productions of the earth.

By a cursory glance at the chemical nature of those plants which at different periods have flourished upon peat beds, we discover in those first thriving, a superabundance of oxalic, tartaric and citric acids, all of which afford not the slightest nutriment to cultivated plants; on the contrary, their presence is exceedingly pernicious to plants abounding in animal nutriment. Again, in the carexes or stinted forest-trees acidiferous compounds predominate, which in constitution are diametrically opposed to those occurring in cultivated plants.

If any considerable portion of these noxious compounds shall remain in peat, by adding a substance that neutralizes their acidity, a mighty barrier to the prosperity of cultivated vegetation is removed.

Hence, when yard-manure abundant in Alkaline compound is added to soils abounding in acids, non-injurious compounds result; the same phenomenon occurs when gypsum or lime is incorporated with acidiferous soils.

The second defect is a want of appropriate inorganic nutriment. Although it contains an abundance of silex, which is an important constituent in vegetable development, it may not and, as we shall contend, does not contain a sufficiency of other elements no less essential than silica in vegetable economy. We may here introduce a physiological axiom, which will enable us to comprehend the phenomenon attending the application of mineral manures, and to better appreciate the value and certain indispensability of inorganic fertilizers.

The truth is this: all plants require inorganic nutriments; each species will select those elements peculiar to itself; perfect development of any plant is not insured unless there is a sufficiency of every requisite element, be it ever so diminutive in quantity. The second and third clauses of this truth have a material bearing upon the condition and improvement of peat lands. Each plant electively gathers from the soil those elements most congenial to its own prosperity; else how should the ash of wheat yield eight times the amount of magnesia that potato-tops do? or oats contain 53 per cent. of silica, and beans only 1 per cent.? And why should there be 6 per cent. of soda in mangel-wurzel and no traces of this alkali in oats, all grown upon the same soil. Those organized bodies that now lie mouldering in peat beds were hardy shrubs and forest-trees, requiring only those elements that would impart strength and inflexibility to their tissue, such as lime and silica; they predominate in the ash of forest-trees to the almost entire exclusion of magnesia, alumina and phosphates, all of which are indispensable to a luxuriant growth of crops furnishing animal nutriment.

That a deficiency of an essential element produces an abortive crop is strikingly illustrated in the culture of cereals: those sown upon soils containing an abundance of organic matter, lime, and soluble silica, produce gigantic stalks destitute of grain; by adding magnesia, an exuberant growth of stalk is induced bearing a withered grain, covered with an exceedingly tenacious epidermis; again, add a compound yielding phosphoric acid to the soil, when a perfect plant is developed, bearing a due share of nutritious aliment—evidencing that the weal or woe of the crop was dependent upon the presence or absence of the last administered compound.

Practical experience has long since established the fact that cereals do not flourish well as a first crop upon reclaimed peat lands, but that they are more successful after the land has received a dressing of yard or mineral manures, and has been ameliorated by tillage with other crops. Can any other cause be assigned for the increment given to the cereals than that a deficient element has been supplied by the yard or mineral manure? From this view of the inorganic ingredients in peat soils we deduce two conclusions showing the necessity of applying inorganic manures.

First, that the organized substance constituting peat, in its primeval or vital state, contained only traces of several inorganic constituents that are found abundant in cultivated plants; second, that a portion of these diminutive constituents have, during the process of decomposition, combined with pernicious acids, and are consequently unavailable nutriment. Now to the third defect in peat soils for the production of cultivated crops, viz., the want of one essential organic element.

Admitting that the four elements, carbon, hydrogen, oxygen and nitrogen, are essential, and did once exist in the substance that composes the soil, we have now to inquire whether these elements exist in the present state of the organic matter, and whether the peat in itself is adequate to supply all the elements necessary for the growth of cultivated crops.

The organic portions of plants are mainly made up of the three elements, carbon, oxygen and hydrogen, the per centages of nitrogen being exceedingly minute in all, but more especially in spontaneous ones. Chemical research has thoroughly established the fact that but a diminutive quantity of nitrogen exists in spontaneous plants, which fact will be at once conceded when we consider that upon the presence or absence of the azotized principle depends the relative value of all fruits, grains, roots and grasses cultivated for animal subsistence. The major parts of all peat beds consisting of semi-decayed spontaneous plants, can contain only those elements peculiar to that class which, when compared with the cultivated one, is found to be much inferior in the azotized principle.

Allowing all the nitrogen contained in the growing forest yet to remain in the decomposing mass, this vital principle will not be found to that extent that it is in animal excrement or decomposing cultivated plants. But to allow the retention of all the elements comprising an organic body during the process of decomposition, would be an absolute violation of the immutable laws that govern the eremacausis [putrefaction] of bodies. During the transmutation of an organized body from an active to an inert state, a slow combustion is carried on, and there are incessantly gaseous products evolved; among the most abundant of these is nitrogen in the form of ammonia. This compound is evolved most freely in the early stages of putrefaction from the slight affinity it possesses for the substance with which it is associated. Consequently a decaying body exposed to atmospheric agencies, is soon deprived of the all-essential principle, azote. Now, in the process of decomposition, which results in the formation of our peat beds, azote is the most important element eliminated, the decaying mass being deficient in ammoniacal attractives which escape with aqueous vapor into the atmosphere. This continuous process of elimination readily deprives the soil of its original diminutive quantity of azote.

If, then, the organized soil has relinquished, in the putrefactive process, a greater portion of one of its preëminent constituents, it is evident, by supplying this deficiency in the form of animal excretions, the luxuriance of those crops requiring a large per centage of azotic nutriment is greatly enhanced.

Hence, in the application of yard-manures abounding in alkalies and azotized compounds to peat lands, twofold results are attained: the alkalies neutralizing deleterious acids and the azotized matters, by decomposition, supply the deficiency of azote. By the use of mineral manures the same primary object is secured as by the inorganic elements in yard-manure; and, as a secondary effect, the unavailable nutritive compounds in the peat soil are gradually transformed into appropriate vegetable nutriment.

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## EXPORT OF FLAX SEED.

The season for shipments of flax seed having passed away without any exports, (except 15 tcs.) we annex the following Table of exports for the previous twenty two years—thus:

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| In 1846 | tcs. 14,382 | In 1841 | tcs. 4,644 | In 1836 | tcs. 18,054 | In 1831 | tcs. 16,053 |
| 1845 | " 9,184 | 1840 | " 10,884 | 1835 | " 29,821 | 1830 | " 15,604 |
| 1844 | " 2,477 | 1839 | " 9,850 | 1834 | " 17,362 | 1829 | " 9,459 |
| 1843 | " 4,259 | 1838 | " 5,187 | 1833 | " 15,093 | 1828 | " 14,428 |
| 1842 | " 2,954 | 1837 | " 5,088 | 1832 | " 8,120 | 1827 | " 16,566 |
| In 1826 | tcs. 15,272 | | | In 1825 | tcs. 25,713 | | |

*Query?*—Why is it that *oil-cake* is so little used as food for beasts in this country, compared to England? It is highly valued there, not only for its nutritive qualities, but especially for the *value it imparts to manure*—in regard to which the discrimination of the English farmer is much nicer than ours. Will some friend who has time please look into this matter and give us a paper about it?—Where to be had; the price; in what way and to what uses applied; what are the impediments to its employment in our country; might not the consumption of it be extended profitably?

# IMPROVEMENT IN HEMP-BRAKES.

## A GREAT DESIDERATUM.

JOHN S. SKINNER, Esq. DEVONDALE FARM, near Newcastle, Del., March 29, 1847.

*Dear Sir:* I was pleased with your suggestion to allow THE FARMERS' LIBRARY to become the vehicle of introducing to public notice the new inventions of agricultural implements and machinery—a matter in which your readers are especially interested—and I trust you may be remunerated for the expense you generously offer to incur for the engravings, in the increased popularity and still farther extended circulation of your valuable standard work.

I send you the description and drawings of a Hemp-Gin, invented and recently patented by my brother, Franklin P. Holcomb, under the following circumstances: My brother, who is a civil engineer by profession, but possessing fine mechanical talents, was stopping with me at my farm, when I happened one day to be reading, from the Farmers' Encyclopædia, what Mr. Clay says in an article he furnished to that work on the subject of Hemp-Machines, which is to the effect that no machine had ever been invented, and he feared none ever would be, to answer as a substitute for the hand-brake. I told my brother that he owed it to the fact of his having been *a farmer's boy* to supply, if possible, this great desideratum to the hemp-growing interest; and also expressed the opinion that we might probably grow hemp here to advantage, if the breaking and scutching could be done by machinery.

He finally went to work at it, and I sowed a small crop of hemp, which we water-rotted. This we got out with the machine. Still he did not think it perfect or right, and went on improving, and altering, and experimenting, for almost another twelvemonth; and meantime I grew a second crop of hemp for him.—This we also got out with the machine, and had a portion of it manufactured into rope. And, finally, the great difficulty that had troubled him so much—the waste in the scutching—was overcome, and we had the satisfaction of seeing this simple little machine break and scutch, with the least possible waste, at the rate of about 1,000 lbs. of clean, merchantable hemp per day—doing the work of some twelve or fourteen men.

But meantime Mr. Billings's machine had made its appearance; and our friend Gen. Tallmadge had commended it so highly in his Address before the American Institute, that my brother, supposing the final object had been attained, and never having entertained any pecuniary views in connection with it, proposed doing nothing farther with his machine. But he subsequently learned that Mr. Billings's machine, though no doubt an excellent one, was large, somewhat complicated, and costing four or five times the price of his, and probably intended rather for a stationary power to work in a manufactory, than for the general use of hemp-growers, to be worked by their hands, on the plantation, or in the fields. Under the circumstances, he applied for a patent, which was granted, and Mr. Obed Hussey, of Baltimore, machinist, the ingenious inventor of the Reaping Machine, has become interested in it, and will take means to introduce it to the attention of the hemp-growers of the West.

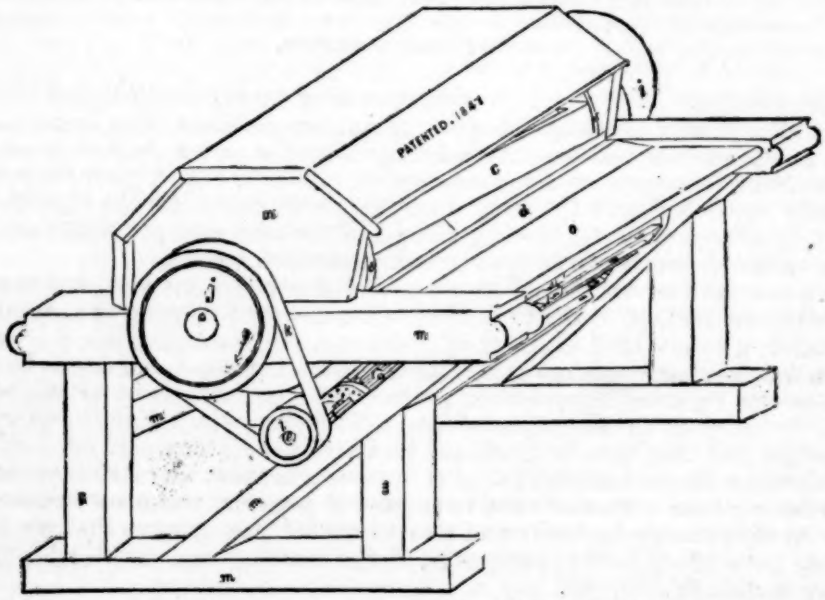
Nothing can be more simple in its construction. The rudest and roughest hands can work it, and with little danger of its getting out of order. The cost of it will be only from $75 to $100, exclusive of the horse-power. It requires about a two-horse power to work it. From my own experience in the use of it, I can confidently say, and assure my brother farmers of the West, that the largest crop of hemp they grow would hold out no terror, so far as the breaking and scutching of it was concerned, with the use of this machine. My clear conviction is that it will go into very general use in the hemp districts, and prove an important acquisition to this branch of Agriculture; and if it does, though not having the slightest pecuniary interest in it, I shall feel myself highly rewarded for the interest I have taken in the enterprise.

Truly yours, CHAUNCEY P. HOLCOMB.

## SPECIFICATION OF HOLCOMB'S HEMP-BRAKE.

*To all to whom these presents shall come:*

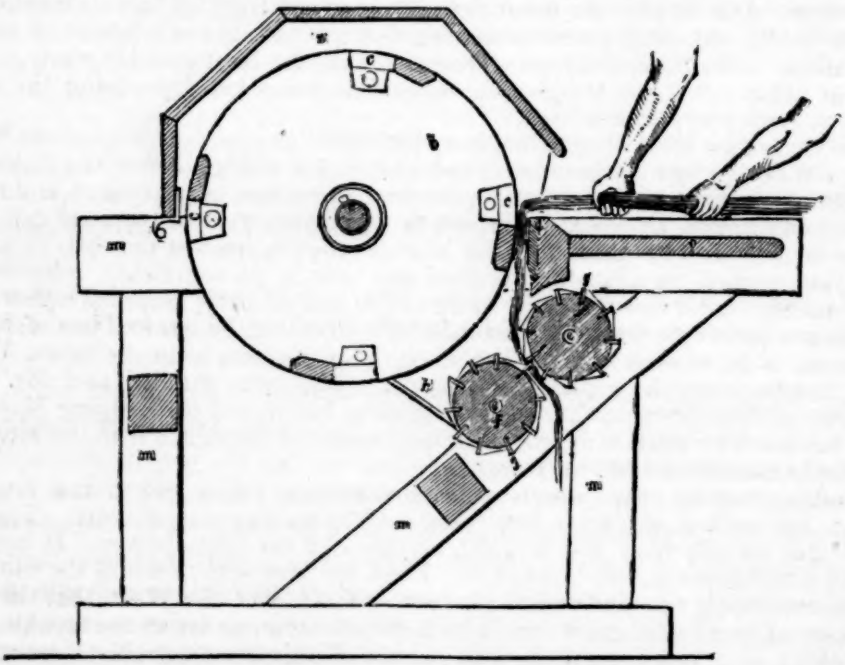
Be it known, that I, F. P. HOLCOMB, of the town and county of Newcastle, and State of Delaware, have invented a new and useful machine for breaking and cleaning hemp at one and the same operation; and that the following is a full, clear and exact description of the principle or character which distinguishes it from




PERSPECTIVE VIEW OF F. P. HOLCOMB'S HEMP AND FLAX GIN.

all other things before known, and of the manner of making, constructing and using the same, reference being had to the accompanying drawings, making part of this specification, in which figure 1 is a perspective view, and figure 2 a vertical section of the machine. The same letters indicate like parts in all the figures.

In machinery heretofore employed for breaking and cleaning hemp, &c. at one operation, by revolving breaks, the hemp has been acted on during a large portion of the circle of revolution, the hemp being broken by passing it between a pair of rollers or revolving breaks and scutchers, that mesh into each other, and break the hemp by bending it short between them. This method is highly objectionable, in consequence



SECTIONAL VIEW OF F. P. HOLCOMB'S HEMP AND FLAX GIN.

of the great length of the fibre over which it i scraping, which is found to wear the hemp in practice so as to render it unmerchantable; it has also been attempted to break and clean the hemp between a revolving break and a stationary concave, but this method is liable to the same objections. In fact, the hemp never can be broken and cleaned by the same roller that breaks it, without subjecting it to injurious wear. Consequently, the machines have been abandoned as useless; for if the hemp is broken by a stationary break, against which the revolving break acts, and thence passes to another wheel, placed in contact with said revolving break, to be scutched, the break scrapes over the hemp the whole distance from the bed-break to the point where the scutcher acts, and wears the surface into tow.

My invention is for the purpose of obviating these difficulties, and is of the following nature: I employ a large revolving break, with the swords set at a tangent (this is necessary to the well-working of the machine, as a small one would present the swords at too great an angle), which acts against a stationary bed-plate, and there breaks the hemp as it is presented by the hand. The ends of the hemp, as soon as they pass down below the edge where they are broken, are thrown off by the centrifugal action of the revolving blades, and they do not come in contact with it any more, but, as the hemp is fed in the ends aforesaid, pass down and are caught between the scutchers at the angle of their junction, without laying against either so as to be rubbed, and is thus cleaned. The scutchers are very small cylinders, with blades projecting from them radially, that only mesh slightly (if at all) past their pitch-lines; these only act on that part of the hemp immediately between them, or at the junction of their curves, to clean it, and it passes through them without injury—which is not the case where the breaking and cleaning are done by the same wheel or roller on the different parts of its circumference.

The construction of my apparatus is as follows: On the cap-pieces of a suitable frame (*m*) I suspend a shaft (*a*) in suitable bearings, on which I affix two cylinder heads (*b*), to which I attach any suitable number of slats or beaters (*c*); these are placed diagonally, and are made to act on a straight, horizontal, stationary bed-piece (*d*), which is armed with iron and attached to the frame (*m*); back of this bed-piece, and a little below its surface, there is a feed-board (*o*), over which the hemp is fed into the machine; just below the bed-piece, two small scutcher cylinders (*f*) are so placed as to receive the hemp between them without wrapping on either, the blades (*g*) of which may work into each other more or less, according to the material to be acted on. The hemp is held in the hand of the workman to be cleaned, and is presented over the bed-piece (*d*), (as clearly shown in figure 2,) where it is gradually broken as it is pushed in, and the ends are thrown down in between the scutchers, where the shieves or hurds are thrown out. The hemp in this way is fed in, cleaned half its length, and then turned and the other half finished, and the hemp comes from the machine in a perfect and merchantable state.

Having thus fully described my machine, what I claim as my invention, and desire to secure by letters patent, is the combination of the stationary bed break and the rotary break, and small scutchers arranged in the manner described, so that the hemp can be fed in by hand, broken and cleaned with but one handling and at one operation—the breaking and cleaning being done on separate cylinders, but the parts so arranged as that they are brought close together, and so adjusted as to only allow the machine to touch that part of the fibre that is to be acted on, thereby preventing its wear in the machine.

F. P. HOLCOMB.

Witnesses, { A. P. BROWNE, J. J. GREENOUGH.

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## OLD MARYLAND—HARD TO BEAT, AFTER ALL.

We much doubt if any portion of the United States has been so much misrepresented, not to say abused, or if any is so much undervalued, as Maryland south and east of the great Mail road. Nothing but the most unfounded and incorrigible prejudice, together with its location, withdrawn as it is from public view, could have prevented it from realizing the prodigious advantages prepared for it by the hand of Nature, and making it at this day the most populous, instead of being one among the most thinly settled parts of the United States.

If we held the political power of the State, we would do for Maryland what every State, and, if not every State, every County, should do for itself. We would cause an actual survey to be made, and all its features and sources of industry and fruitfulness to be mapped and otherwise portrayed, so that all its capabilities, whether agricultural, mineral, commercial, geographical and hygeian, should be fully and honestly displayed to the view of every impartial inquirer.

Communities rarely reflect how much they may be prejudiced, collectively and individually, by the ignorance, sometimes by the malicious perversions, of statis-

tical writers and historians; and, for ourselves, we do not know of any region of our country which in this way has suffered so much in general repute as the *Eastern Shore of Maryland.* We have not now here either leisure or space to illustrate this impression of ours, as we might do; but let any man at all acquainted with the natural fertility of the soil over a vast proportion of that district, and with its unequaled advantages in its cheap transportation to, and its choice of markets, read the following, which is the description with which a stranger or foreigner would be most likely to be met, in any extensive range of inquiry for a country to settle in:

"The part of the State east of the Bay is called the *Eastern Shore;* the part west, the *Western Shore.* The country on the eastern side of the Chesapeake Bay, with the exception of a *small part* of the northern extremity, is an extensive plain, *low* and *sandy*, much intersected by rivers and creeks—having few springs, and *abounding with stagnant water.* In this part [that is, all except a "*small part*"] the air in summer is moist, sultry and disagreeable, and the inhabitants are subject to agues and intermittent fevers, and many of them have a sickly appearance."

In this flattering portrait, to be found in a popular Cyclopædia, behold! ye farmers of the Eastern Shore, one of the influences under which, with unrivaled capabilities, your population has been stationary for the last thirty years, and that almost within sound of the fire-bells of Baltimore and Philadelphia, and within a few hours' steamboat communication with New-York, and other town populations, amounting to a million of consumers of all your produce!

We remember, many years since—indignant at the injustice done to you by that common liar, Madame Rumor—to have published in the American Farmer, in reference to the charge of unhealthiness, a list of a greater number of very aged people, male and female, then residing within a given distance of the "*Royal Oak,*" in Talbot county, than were to be found within the same area, probably, in any part of our country. As to the "sickly appearance," said to be characteristic of the people of the Eastern Shore, we doubt if the writer had ever attended a gathering at church, or at a cattle-show, or a fish feast, or a "public day" in Kent, or Queen Anne's, or Talbot, or Dorset, or Somerset, or Worcester counties. They are not people of "sickly appearance" who hunt, and shoot, and ride, and spread such tables, and play at knife and fork, as they do. There is, it may be admitted, some *locomotion* in the surface soil around Snow-Hill; but, as every swallow does not make a summer, that should not give to nine counties the character of being "*low* and *sandy.*" And, as for their social and moral habits, we think we know "some;" and when we speak of their hospitality, we speak of what is universally admitted. The same may be said of their integrity and pride of character, *as a community.*

In all large flocks, there are apt to be a few black sheep, and even their wool has its uses. Besides, it takes a good many kinds of people to make a world and give it the charm of variety; but we hope there are, or soon will be, none to deny the *intellectuality* of the farmer's pursuit. *Any folly or outrage but that!* As to their *pride*—whether from a consciousness that their country is underrated abroad, or what, we know not, but they must allow us in candor to add that, when from home, the Eastern Shoreman is a *leetle* stiff-necked! Like the Indian, he stands up so straight that he leans backward. Thus it is that, when abroad, they never, or very rarely, make the first advance toward sociability; but when they see that you are ready to do them justice, and give them their due, then will you begin to know what a hospitable and true-hearted man is.

As to the soil, we may mention—though not, by any means, as fair specimens

of general average produce or management—that among (we don't say because) subscribers to this journal in Talbot and in Dorchester counties, two of them the past season grew, one upward of 70 bushels of Indian corn to the acre, on more than forty acres, and the other 2,000 barrels on two hundred acres; and this corn might be shelled from the fields where it grew, into the holds of vessels, at the rate of 1,000 bushels a day, by machines invented by one of these farmers, and be transported to a cash market for 4 or 5 cents a bushel. *Why be forever dreaming of change?* Is it not better to let very well alone—except in trying to improve it?

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## AGRICULTURAL SCHOOLS.

GROWING EXCITEMENT ON THE SUBJECT—COURSE OF INSTRUCTION PROPER TO BE PURSUED IN THEM.

RARELY, within our observation, has the public mind evinced more numerous and unequivocal signs of increasing and general interest on any subject than is now manifested, more and more, every day, in reference to *Agricultural Education.* Three long columns of a late Albany paper are filled with a highly edifying and important discussion on Agricultural Colleges, in which Members of the Legislature and of the State Agricultural Society participated. We should rejoice to see this debate copied into every paper in the Union; and how much more useful for general reading and consideration would it be than the incidents of party struggles, and the details of bloody battles!

It was well done, on the part of Mr. S. Howard, "of the Cultivator," to warn the public not to be too impatient for carrying out and realizing the public wishes in this matter. "He thought the necessity of having a plan fully matured and understood as obvious. It was the wise remark of Franklin to his nephew that in whatever he did there should be a *plan.* The causes of failure had been in the intrinsic defects in organization." "The qualifications necessary for the management of such a school are rarer than are at first imagined. They embrace the whole variety of agricultural knowledge."

Many gentlemen took part in the discussion, with a degree of earnestness that evinced much anxious reflection and that gives assurance that the *people* are beginning to be persuaded that they have a right to use their own means for the instruction of their own children in the art and principles of their own business. We venture to express the opinion that these schools should not be left, any more than naval or military schools, to depend on *individual contribution.* They are, of all schools, the most proper objects for, and the most entitled to *public patronage.* In every State, its proportion of the proceeds of the public lands should be appropriated exclusively to the support of Normal Schools, in which young men should be gratuitously prepared to act as agricultural professors in subordinate county and district establishments. In the mean time, might not a direction be given to the patronage *now* bestowed on the district schools in the State of New-York that would throw into the course of education pursued in them a *deeper infusion of agricultural knowledge and literature?*

But we have no space or time now to discuss details. We beg again for the sympathy and aid of the Press in pressing this subject home to the minds of the people—the farmers throughout the country. Let us go on begetting the *will,*

assured that in this, as in all other cases, where there is a *will* there is, or soon will be found, a *way* to do everything. Time and public anxiety will soon work out the plan. But as Mr. Howard wisely remarks, to prevent miscarriage we should be careful on that point.

In regard, then, to the plan and course of instruction, it may be of some use to give from the English "AGRICULTURAL MAGAZINE" an outline of a course of instruction adopted in a distinguished agricultural training school, at which it is said are sons of gentlemen from most of the countries in England, as well as from Wales, Scotland, and Ireland. The officers are, a *Resident Head Master*, three *Resident Assistant Head Masters*, a distinguished *Professor of Agriculture* and *Botany*, Mr. J. DONALSON, author of "British Grasses," "Treatises on Manures," &c.; together with *Professors of Breeds—Management and Diseases of Cattle—Chemistry—Geology and Mineralogy—Natural and Experimental Philosophy—Practical Surveying and Leveling.*

In the departments of *Agriculture* and *Botany* the instructions embrace the practice and the principles of Agriculture in the various counties. The history of all the operations are dwelt on with minuteness, and the effect of each pointed out on the farm attached to the school. The process of drainage, application of manures, erection of farm buildings, and formation of roads, and these subjects are not only examined and explained in the class-room, but practically carried out in the field.

On Botany, the lectures are not simply confined to the distinguishing of one class of plants from another, but embrace their uses, growth, habit, properties, the laws which regulate their distribution, as well as their existence and the laws of vegetation, whereby Agriculture, Horticulture and Floriculture, whether in the garden, the field, or the forest, are rendered most productive. It is the endeavor to render practical, as well as theoretical, the instruction to the pupils; especial attention is devoted to a thorough knowledge of the distinguishing characters of the grasses, cereal, natural, and artificial; their growth and productiveness, as well as the soils and manures suited to them. The Professor, in furtherance of these views, and with the object of rendering his instruction entertaining as well as useful, accompanies the pupils occasionally in their botanical excursions. For this department Mr. Gowen, for his Mount Airy College, need go but a little way, if Doctor DARLINGTON, of his State, could be had.

BREEDS, MANAGEMENT AND DISEASES OF CATTLE.—In this course of lectures, the external conformation of the ox, sheep, and other domesticated animals, with the internal structure of each, both in reference to the changes caused by disease, constituting Pathology, and the uses to which the various parts of the frame are applied, constituting Physiology, are explained. The treatment and causes of disease, and general management of cattle are particularly dwelt upon. The lectures are illustrated by anatomical drawings and specimens, both morbid and healthy.

CHEMISTRY.—These lectures comprehend the properties of the most familiar bodies, their bearing upon the economy of Nature, and their useful application; comprising the elementary substances, oxygen, nitrogen, &c.; the metals; the earths; the properties of heat; light; the laws of chemical affinity; of composition and decomposition; the elements and proximate principles of vegetable and animal substances; germination; assimilation; secretion, &c.; fermentation, vinous, acetous, putrefactive; soils; fallows; manures, vegetable, animal and mineral. The subjects of the lectures are illustrated by experiments, and instruction in chemical analysis is also given in the Professor's Laboratory.

GEOLOGY AND MINERALOGY.—The objects of the Professor in this course are to convey, in the most familiar and instructive manner, the fundamental principles of these sciences; their connection with Chemistry, Botany, Zoology, Astronomy, and Physics; and their practical application to several of the most important wants and utilities of life.

NATURAL AND EXPERIMENTAL PHILOSOPHY.—This department embraces instruction in the elements of Mechanics, the mathematical principles of Statics, or the art of weighing solid bodies; Hydrostatics, or the art of weighing fluids; Dynamics, or the science of the motion of bodies that mutually act on each other; and Hydraulics, with their various practical applications; the theory of the strength of materials, of the stability of structures, the principles of mechanism, the dynamical theory of machines, and of the steam-engine in particular, are fully explained, and the lectures are amply illustrated by models, diagrams, &c.

PRACTICAL SURVEYING AND LEVELING.—This course is at once theoretical and practical; in the school it embraces the various in-door details of a land surveyor's office; and in the field, the uses and applications of the several surveying instruments. It also includes the measurement of timber and artificer's work, the theory and practice of leveling and draining, the making of sections, and mapping from the field-book, and all the requisite and practical detail of geodesy, or the art of surveying the earth on whatever scale.

ANALYSIS OF SOILS, ETC.—The analysis of soils, manures, the various chemicals used in the arts, as well as all the varieties of minerals, are undertaken, for the purpose of determining their value; estates surveyed and mapped; timber measured and valued.

It is not that Professors well qualified are not to be found in our country, if suitable rewards and distinction were offered. We doubt not our military school graduates every year a number who would make very distinguished instructors in several departments, but they are for the most part either the sons of men of independent fortune, who return to their estates, or who choose to follow more attractive professions, or who remain in the army, where their pay, besides being equal, or nearly so, in the beginning, to our best-paid professors, carries with it the inestimable advantage of a *life commission* and sure increase of rank and emoluments.

For a single institution it would be easy at once to name highly accomplished Professors, were it not invidious, but it would be to the dishonor of the country to suppose that such men are not already better provided for. But truth and justice, after all, demand the acknowledgment that in no department of social life and useful labors is such gross and short-sighted injustice perpetrated by society as in its mean estimate of the pay and respect due to *instructors of youth*. The money expended for military purposes, even in time of profound peace, would secure to the *mass of young persons throughout the United States* such an education as is described above. Is it possible that an enlightened, self-governing people will much longer forbear to demand this more noble and salutary appropriation of their contributions for the support of Government?

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☞ THE LIST OF PREMIUMS OFFERED BY THE NEW-YORK STATE AGRICULTURAL SOCIETY has been received from the obliging and accomplished Secretary, and extracts have been prepared, with such observations as they seemed to suggest; but want of room compels their postponement to our next number, in June. The approbation expressed will not, we hope, be the less acceptable for not being altogether wholesale and indiscriminate.

## AGRICULTURAL COLLEGE AT MOUNT AIRY.

In recognition of the popular feeling referred to in the preceding article, and from his own clear perception of what is demanded for the dignity and benefit of American Agriculture, proposals have been issued by Mr. JAMES GOWEN, (well and favorably known for his zeal and energy, and the liberal scale of his expenditures in the field of practical Agriculture,) for the establishment of an Agricultural College at Mount Airy, near Germantown, Pa., in a healthy region of industrious practical Farmers.

"The terms will be *two hundred dollars* per annum, for board and tuition, payable half-yearly in advance—no extras, except for modern languages, for which it may be necessary to make some additional charge."

Were it our custom to insert, as it is not, either advertisements or proposals at length, which, like this, are in the nature of advertisements, it would be altogether unnecessary in this case, for the information of the public, it being all sufficient, if not more respectful toward him and his design, merely to state that Mr. GOWEN has undertaken to supply what he justly considers "the great desideratum—a training in rural economy, pending the progress of the student in literature so that when he shall graduate, he may not only have achieved the usual attainments acquired in literary institutions, but exhibit a thorough and well grounded knowledge of practical and theoretical Agriculture and Horticulture, and possess, in a superior degree, the presumable addition of good health and habits; being thereby the better fitted to enter upon the general duties of life, or into any profession as that of Agriculture."

Than this enterprise of Mr. G., few can be imagined of a more responsible character, when its true nature is properly understood and appreciated; and none can excel him in the spirit to go ahead, in whatever he undertakes as proved by the best of all tests—his actual success in the branches of industry to which he has devoted his time and talents. For the conduct of such an establishment, he is among the last who need be told that Professors of the highest attainments, of the purest character, and of the most elevated ambition, will be required. Happily, and doubtless with a view to insure such men, the terms prescribed will command the services of the first Professors to be found, whether at home or abroad. Under the management of such men, all cultivators who can afford it will rejoice on behalf of their sons, to avail themselves of an institution where they may be taught not to follow in the footsteps of their predecessors, but to advance, by a more elevated path, to a higher platform of intelligence and efficiency. An institution in which they may be inspired with a fondness for their pursuit, by the charms of its proper literature; and where they may learn by experiments on the spot to comprehend and illustrate all its principles.

The chief difficulty as we apprehend, will be to engage professors of the various and proper qualifications. It is to rear and provide an ample stock of such, (we may here repeat), that we need in the first instance, *normal establishments in each State in the Union*, to be maintained and conducted on a plan similar to that of the West Point Academy. See, after waiting happily for thirty years, for an opportunity to gather the crimsoned fruits of warlike achievements, what irresistible prowess and efficiency the *èleves* of that institution communicated to the

American army in every battle-field! Glorious for the national arms as have been the results of every encounter, where the science of the school has directed the valor of the soldier; how yet much more beneficial for the great interests of society would it be to have schools in every State, that would insure scientific direction, every day, and every year, to *the whole agricultural industry of the country!*

In alluding, however, to the difficulty of procuring highly qualified professors, in the various departments as described in the preceding article, we ought to add, that if we rightly appreciate Mr. Gowen's temper, it is just of that sort, which difficulties only stimulate until they are overcome. We need hardly add, farther, that we hope and wish for his enterprise all the success to which its great usefulness entitles it—amply provided for, and well conducted, as we cannot doubt it will be.

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## FENCES,

### A BURDEN ON THE AMERICAN FARMER.

To the Editor of The Farmers' Library: MARYLAND, April, 1847.

SIR: As the friend of Agricultural Reform, I have taken the liberty of addressing you on a subject of vital importance to the farmer of every State in the Union, and more particularly important is it to those of the old States, where every year the scarcity of timber is becoming more apparent. I allude to the present system of inclosing land, or, in other words, it may be called the "fence oppression." Did the intelligent farmer reflect a moment and estimate the annual tax which his fences impose upon him, he would not rest till the system was abolished, or else the live hedge took the place of the present expensive fence of timber.

The system of compelling every landholder to inclose his property is peculiar to the United States, with only the exception of England, where the fence nuisance appears again under the form of the hedge; and although these hawthorn hedges, when they are well tended—and not more than half of them are so—are beautiful objects, and answer all the purposes of protection against the inroads of cattle, still the public voice is beginning to cry out against them, because of the enormous amount of land required to support them. Each hedge is 5 or 6 feet wide at its base, and taking into account the amount of land they exhaust on either side, the whole space cannot be less than 12 or 14 feet wide. When it is recollected that the divisions and subdivisions of land in England are very numerous, the amount of arable land abstracted from the purposes of Agriculture is very great. It has been estimated at several million bushels of grain.

Now turn a moment and look at the situation of things on the Continent, particularly in France, Germany and Italy. In these countries a fence of any kind is a rare sight; cattle are never seen unattended (unless tethered) on the fields. If the farmer has a piece of land he wishes to graze, the cattle or sheep are put under charge of the shepherd's dog, and with his sagacity and the docility of the animals, but little difficulty is experienced in confining them to a limited spot. Sometimes a little boy or girl may be observed holding the cords attached to the horns of 3 or 4 cows, while they graze quietly around.* In connection with this subject, it may be proper to remark, that neither in Great Britain or on the Continent are cattle allowed to go at large upon the public highways. In journeying through France—now one of the best cultivated countries in Europe, 100 square miles producing, probably, at least as much as the same amount in England—it seems

* In Turkey they consider an annual *grassing* of three weeks as necessary to the health and condition of their horses. About the 1st May they are sent into the country and placed in fields of grass or grain which has just arrived at a mowing state. Each horse is tethered to a stake by a rope about eight feet long; this gives them a circle of sixteen feet diameter to feed from, from which, when they have eaten close, the stake is drawn and moved to a fresh spot, a very economical plan of consuming the product of a field. All the horses wore heavy woolen covers.

as though you were riding through one vast farm, no perceptible divisions of property being visible. Lucern, clover, &c., are grown in large quantities, and fed to the cattle in the yard adjoining the barn or stable.

No doubt the chief cause of the depressed state of Agriculture in the United States, is owing to the extensive system of fencing, which, amounting to a heavy annual tax, consumes the best proportion of the farmers' profits. Mr. Biddle, a few years since, in an address before the Philadelphia Agricultural Society, stated that the cost of the fences in Pennsylvania amounted to $100,000,000, and their annual expense he estimated at $10,000,000. A distinguished writer on National Wealth says: "Strange as it may seem, the greatest investment in this country, the most costly production of human industry, is the common fences which inclose and divide the fields. No man dreams that when compared to the outlay of these unpretending monuments of human art, our cities and our towns, with all their wealth, are left far behind. In many places the fences have cost more than the fences and farms are worth. It is this enormous burden which keeps down the agricultural interest of this country, causing an untold expenditure, besides the loss of the land the fences occupy."

Estimating a chestnut post-and-rail fence to last 18 years, and including inside fencing and repairs, the *annual* tax to the farmer holding 150 acres will be $130 to $140, and judging from present appearances, this tax is eternal, and there seems but little hope of escape from it. Now, if we must have hedges, why not adopt the live hedge; for at last a plant has been found which possesses none of the objections to which all other plants hitherto tried in this country have been found liable. The plant in question is the Osage Orange, now extensively used in the neighborhood of Philadelphia, where it has proved eminently fitted for the purpose. It is perfectly hardy south of New-York, growing rapidly and forming a beautiful, impregnable hedge, in five years; it is also free from the attacks of all insects as well as animals. Double rows form the best hedge, though many of those about Philadelphia are planted in single rows. At $12 50 per 1,000 plants, it would cost somewhere about $375 to fence the exterior of a farm of 150 acres; and this, you will recollect, never has to be renewed. The two annual trimmings it requires will, of course, take some time, but nothing in comparison to the time and expense required in repairing a fence of timber. But it is unnecessary to go to the expense of purchasing all the plants required; by procuring 1,000, or a quart or two of seed, and planting them in a rich nursery, cultivating them for a year, they then may be taken up, (to set where the hedge is to be formed,) and the trimmings afforded by the roots, by proper planting, will afford another lot of plants, and these, when large enough to set out, will afford more cuttings from the roots; and thus, by beginning with a few plants, one may fence any number of acres he desires.

These remarks have been hastily written, not so much with a view to publication, but rather to call your attention to a subject which, whether resolving itself into the question of doing away with all fences or adopting the live hedge in place of the rail fence, is of great importance to the agricultural interest.

A SUBSCRIBER.

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## GOVERNOR WRIGHT:

### HIS ADDRESS TO BE DELIVERED BEFORE THE NEW-YORK STATE AGRICULTURAL SOCIETY.

WE rejoice to see that Governor WRIGHT has consented to deliver the next Annual Address, not knowing on whom we could more safely rely for a strenuous maintenance of the preference to which Agriculture is entitled, as far as legislation is brought to bear for the promotion of any of our industrial pursuits.

We doubt not we shall hear him dwell on its claims to be considered an intellectual employment, to be rendered, like other professions, more dignified and profitable in proportion as it is conducted with an understanding of the principles which, in its very nature, belong to it, and that he will insist and enlarge on the right of the agricultural community to have a just proportion of their contributions to the support of Government and other educational institutions so appropriated as to promote, especially, a better knowledge of the arts of cultivation and the rights of the landed interest.

# SCRAPS.

SEEDLING PLANTS AND VEGETABLES.—Agricultural Societies, if guided by reflection, instead of precedent, would offer to those who by persevering experiment establish new and valuable varieties of fruits and vegetables, ten times as much as they now offer for sleek stallions and pampered geldings, and heavy crops from patches of corn.

A new variety of the potato, for example, is generally considered to continue in perfection not more than 14 years. Fresh varieties must therefore be raised—and how few will take the trouble to do it? He who does, and succeeds in supplying the place of a declining peach, or apple, or potato, is a *real* benefactor of his country, and deserves higher reward than the inventor of a new shell for dealing death and destruction to the human race, which, by-the-by, rarely falls upon the real authors of the mischief that plunges nations into war.

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MANURES OUGHT TO BE EXEMPT FROM TOLLS. In England, the statute of 52 George III. works a general exemption from toll for the benefit of Agriculture, in favor of wagons, carts, &c., loaded with manure, as well as those going empty. So our Legislatures, in granting charters for these highways, should exempt from toll, or greatly diminish the charges on loads of lime, guano, plaster, and all other substances when going to be used bona fide and extensively *as manure*. Nor would these incorporated monopolies lose anything in the end, inasmuch as the produce and population of the country to be enriched by the application of these manures would be increased in proportion, and the roads and canals be thus fully indemnified and the State strengthened in numbers and wealth.

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DOCTOR JOS. E. MUSE, well known to the friends of American Agriculture as a distinguished and scientific investigator and practical experimentalist, speaking of Indian corn says: "The *Baden* has been my favorite for many years, as the most productive and most heavy of any kind I have ever tried. I mean the pure white-flint Baden. There are several varieties passing under that name, very inferior to that I allude to." But the Doctor adds that last year, on two measured acres, one with *Oregon* and one with *Baden*, planted under precisely similar circumstances in all respects, he got ten barrels of the Oregon, and only eight of the Baden.

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☞ We regret that the communication of "*Reuben Roadside*" was received too late for insertion in this number.



GUANO—*Sometimes injurious, and when.*—Mr. Rendle and other persons record, as the result of dearly purchased experience, that where guano has failed to be beneficial, or has been injurious, it has been applied in quantities too powerful for the plants to bear. In a liquid state *half an ounce per gallon of water*, and given to growing plants once a week, it never fails to be productive of vigor. Five hundred weight to the acre has been known to double the crop of onions.

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WHEAT CROP.—There is reason to believe that the crop of wheat now on the ground has been considerably injured by an open, freezing and thawing winter, the last snows of which are fast disappearing. We have taken considerable pains to collect the earliest and most reliable information on the subject, in order that we might keep our readers duly advised in a matter of so much commercial as well as agricultural importance. The extent of the damage done to wheat cannot as yet be definitely known. It will be found, if we mistake not, far more serious than usually occurs in Western New-York. [Rochester American.

We apprehend the above remarks are applicable to a very large portion of the country. One of the most reliable men in all respects, writing us from Maryland, says: "What a wet winter we have had! and how adverse to all farming operations"!!!

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☞ It's a tall feather in the cap of the old AMERICAN FARMER, the pioneer in the field of American agricultural literature, to have a judge so eminent as Doctor MUSE say of it: "It is in my opinion one of the best agricultural journals in our wide country, whether we regard its selections or its editorials."

"*Laus est laudari a laudato viro.*"

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PRESERVATION OF FLOWERS.—Among scientific discoveries, we may state that Dr. Fascale, a chemist at Westeras, in Sweden, has announced to the Academy of Sciences at Stockholm his discovery of a process for preserving flowers in their natural condition. He sent, it is stated, some roses which he assures the Academy were prepared by him in 1844—and which have still all the appearance of being freshly gathered.

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PREVENTION OF THE FOOT-ROT IN SHEEP.—Mr. Karkeek states "that the foot-rot is easily prevented by carting a quantity of earth in the form of a mound, in the center of the yard attached to the shed, upon which are occasionally strewed small quantities of slaked lime."

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GRAFTING CLAY is best made of two parts cow-dung, three parts common clay, and one part awns or beards of barley or other grain, kneaded together thoroughly.

## NIGHTSOIL, OR POUDRETTE.

We were much disappointed lately in missing an opportunity to see the establishment gotten up in Philadelphia by Mr. Minor, the talented and persevering Editor of the *Railroad Journal*, for the preparation of *Poudrette*. It was our wish to have seen it and to have obtained some particulars as to the scale and particular region of its operations.

We understand, generally, that his sales have been extensive and constantly increasing. Besides its being undoubtedly among the most powerful of all fertilizers, its materials being of the richest, it has, like guano, the great advantages of condensation, portability, and of not propagating noxious weeds. The excrement of birds is said to derive its value, in a great measure, from the fact that it combines the urine with it. While we throw away the offerings to that delicate Goddess, Cloacina, they "order things differently in France." There, as in Rome of old, the city government appoints their *curatores cloacarum urbis*; and thus the City of Paris derives a revenue of about $200,000 for the privilege of permitting certain persons to collect and use the nightsoil of the city.

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EXPORT OF GRAIN from the U. States to G. Britain and Ireland, from Sept. 1, 1846, to March 27, 1847.

| | | | |
|---|---|---|---|
| Wheat | bushels 1,273,882 | Rye | bushels 2,685 |
| Indian Corn | " 6,931,640 | Oats | " 144,069 |
| Barley | bushels 130,071 | | |

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# PRICES CURRENT.

[*Corrected, April 24, for the Monthly Journal of Agriculture.*]

| | | | |
|---|---|---|---|
| ASHES—Pots, 1st sort | ℔ 100 lb. | 5 — | @ 5 06½ |
| Pearls, 1st sort, '46 | | — — | @ 6 50 |
| BEESWAX—American Yellow | | — 26 | @ — 26½ |
| CANDLES—Mould, Tallow | ℔ lb. | — 11 | @ — 12½ |
| Sperm, Eastern and City | | — 31 | @ — 38 |
| COTTON—From | ℔ lb. | — 10½ | @ — 14½ |
| COTTON BAGGING—American | | — 12½ | @ — 13 |
| CORDAGE—American | ℔ lb. | — 11 | @ — 12 |
| DOMESTIC GOODS—Shirtings | ℔ y. | — 5 | @ — 11 |
| Sheetings | | — 7 | @ — 15 |
| FEATHERS—American, live | | — 28 | @ — 33 |
| FLAX—American | | — 7 | @ — 8 |
| FLOUR & MEAL—Genesee | ℔ bbl. | 8 — | @ — — |
| Troy | | 7 87½ | @ — — |
| Michigan | | 7 87½ | @ — — |
| Ohio, Flat Hoop | | 7 87½ | @ — — |
| Ohio, Round Hoop | | — — | @ — — |
| Ohio, via New-Orleans | | — — | @ — — |
| Pennsylvania | | 7 37½ | @ 7 50 |
| Brandywine | | 7 37½ | @ 7 50 |
| Georgetown | | 7 50 | @ — — |
| Baltimore City Mills | | 7 37½ | @ 7 50 |
| Richmond City Mills | | 8 50 | @ — — |
| Richmond Country | | 7 37½ | @ 7 50 |
| Alexandria, Petersburg, &c. | | 7 37½ | @ 7 50 |
| Rye Flour | | 5 12½ | @ 5 25 |
| Corn Meal, Jersey and Brand | | 4 50 | @ 4 75 |
| Corn Meal, Brandywine | hhd. | — — | @ — — |
| GRAIN—Wheat, White | ℔ bush. | 1 70 | @ 1 75 |
| Wheat, Red | | 1 45 | @ 1 55 |
| Rye, Northern | | — 95 | @ — — |
| Corn, Jersey and North | (meas.) | — 93 | @ 98 |
| Corn, Southern | (measure) | — 92 | @ — 95 |
| Corn, Southern | (weight) | — — | @ — — |
| Oats, Northern | | — 49 | @ — 50 |
| Oats, Jersey | | — — | @ — — |
| HAY—North River in bales | ℔ 100 lb | — 60 | @ — 65 |
| HEMP—American, dew-rotted | ton | 140 | @ 160 — |
| " " water-rotted | | 160 | @ 220 — |
| HOPS—1st sort 1846 | | — 8½ | @ — 9 |
| IRON—American Pig, No. 1 | | — — | @ 32 50 |
| " Common | | 22 50 | @ 25 — |
| LIME—Thomaston | ℔ bbl. | — 85 | @ — — |
| LUMBER—Boards, N.R. | ℔ M. ft. clr. | 30 — | @ 35 — |
| Boards, Eastern Pine | | — — | @ — — |
| Boards, Albany Pine | ℔ pce. | — 10 | @ — 18 |
| Timber, Georgia Pine | ℔ M. ft. | 27 50 | @ — — |
| Staves, White Oak, pipe | ℔ M. | 50 — | @ — — |
| Staves, White Oak, hhd | | 40 — | @ — — |
| Staves, White Oak, bbl | | 30 — | @ — — |
| Staves, Red Oak, hhd | | 24 — | @ 28 — |
| Hoops | | 20 — | @ 30 — |
| Scantling, Eastern | | 15 — | @ 16 25 |
| Scantling, Oak | | — 30 | @ — 35 |
| Timber, Oak | ℔ cubic foot | — 20 | @ — 30 |
| Timber, White Pine | | — 13 | @ — 20 |
| Timber, Georgia Yellow Pine | | — 24 | @ — 28 |
| Shingles | ℔ bunch | 1 75 | @ 2 — |
| Shingles, Cedar, 3 feet, 1st quality | | 26 — | @ — — |
| Shingles, Cedar, 3 feet, 2d quality | | 22 — | @ 24 — |
| Shingles, Cedar, 2 feet, 1st quality | | 17 — | @ 18 — |
| Shingles, Cedar, 2 feet, 2d quality | | 15 — | @ 16 — |
| Shingles, Cypress, 2 feet | | 13 — | @ 14 — |
| Shingles, Company | | 28 — | @ 30 — |
| MUSTARD—American | | — — | @ — — |
| NAILS—Wrought, 6d to 20d | ℔ lb. | — 10 | @ — 14 |
| Cut 4d to 40d | | — 4½ | @ — 4½ |
| PLASTER PARIS | ℔ ton | 2 87½ | @ 3 — |
| PROVISIONS—Beef, Mess | ℔ bbl. | 11 75 | @ 12 50 |
| Beef, Prime, | | 8 50 | @ 9 25 |
| Pork, Mess, Ohio, old | | 14 87½ | @ 15 — |
| Pork, Prime, Ohio, old | | 13 — | @ 13 12½ |
| Lard, Ohio | ℔ lb. | — 9 | @ — 10½ |
| Hams, Pickled | | — 8½ | @ — 9½ |
| Shoulders, Pickled | | — 6½ | @ — 7 |
| Sides, Pickled | | — — | @ — — |
| Beef, Smoked | ℔ lb. | — — | @ — 11 |
| Butter, Orange County | | — 25 | @ — 28 |
| Butter, Western Dairy | | — 18 | @ — 20 |
| Butter, Grease | | — — | @ — — |
| Cheese, in casks and boxes | | — 7 | @ — 8 |
| SEEDS—Clover | ℔ lb. | — 6½ | @ — 7 |
| Timothy | ℔ tierce | 17 — | @ 21 — |
| Flax, Rough | | — — | @ 11 50 |
| SOAP—N. York, Brown | ℔ lb. | — 3½ | @ — 5½ |
| TALLOW—American Rendered | | — 8½ | @ — 9 |
| TOBACCO—Virginia | @ lb. | — 2 | @ — 6 |
| North Carolina | | — — | @ — — |
| Kentucky and Missouri | | — 3 | @ — 7 |
| WOOL—Am. Saxony, Fleece, | ℔ lb. | — 35 | @ — 37½ |
| American Full Blood Merino | | — 32 | @ — 34 |
| American ½ and ¼ Merino | | — 27 | @ — 30 |
| American Native and ¼ Merino | | — 25 | @ — 27 |
| Superfine, Pulled | | — 30 | @ — 32 |